

FIG. 1B1

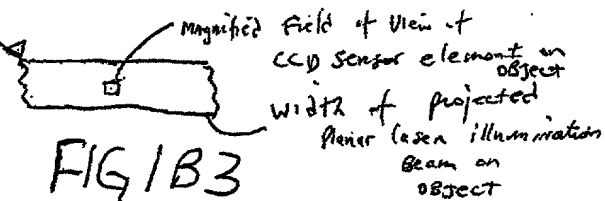
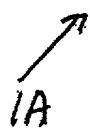
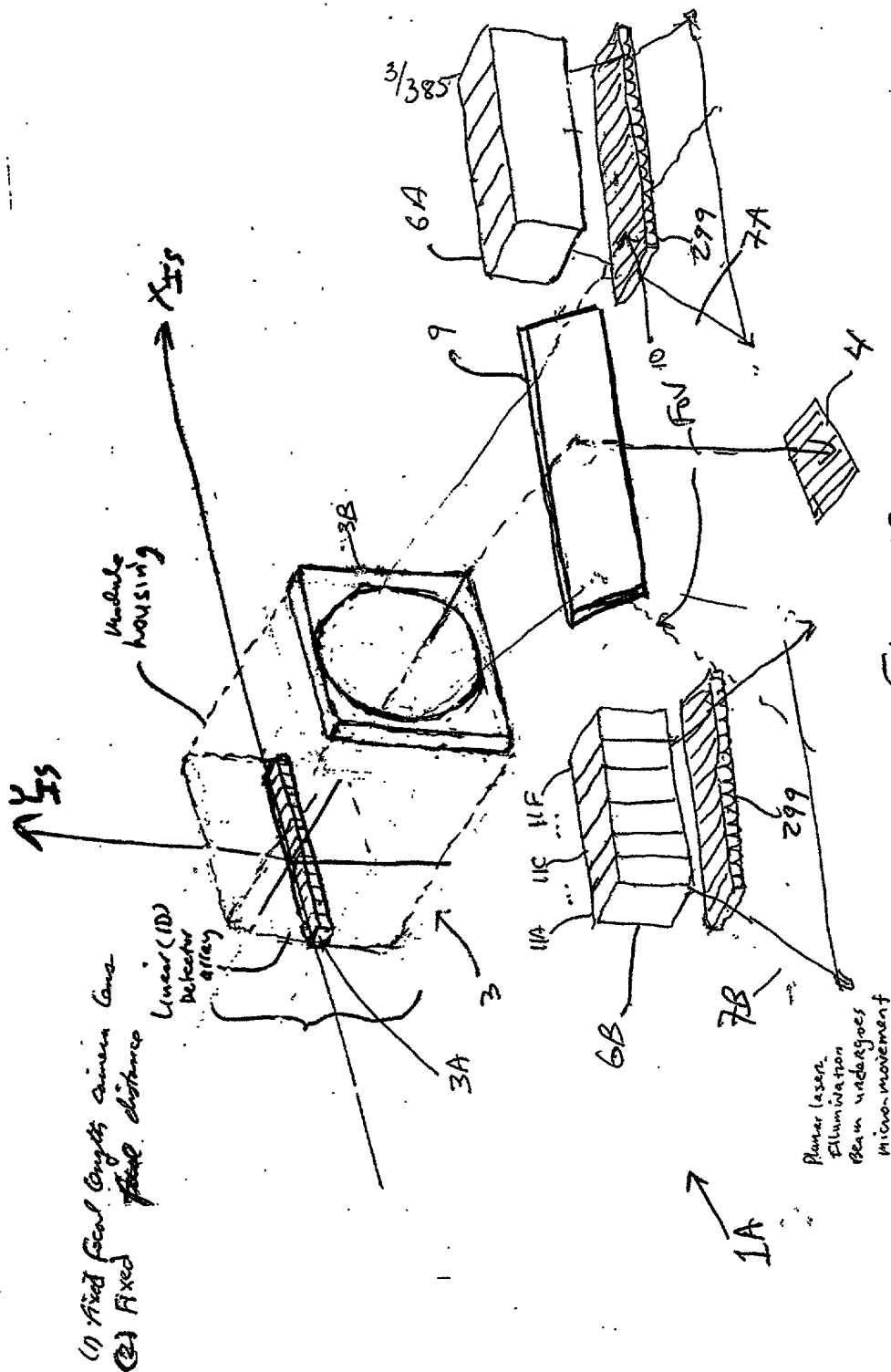
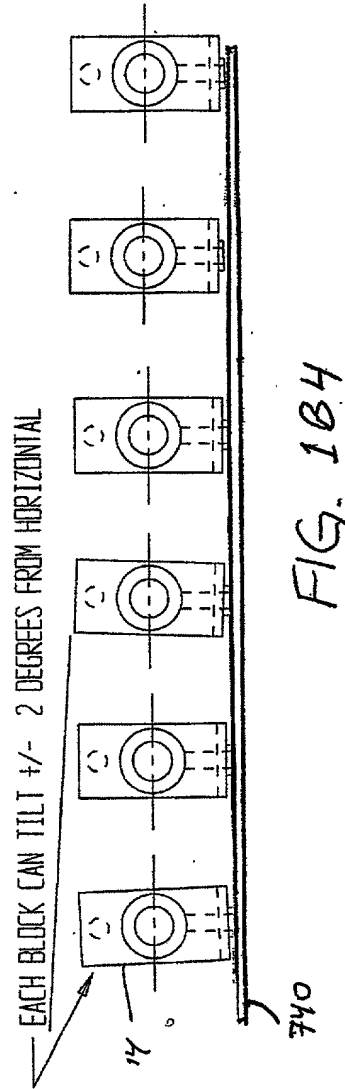


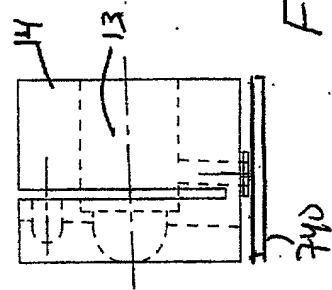
FIG 1B3



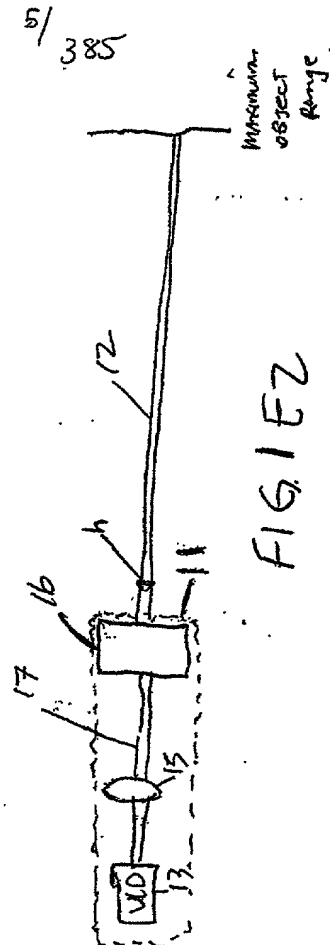
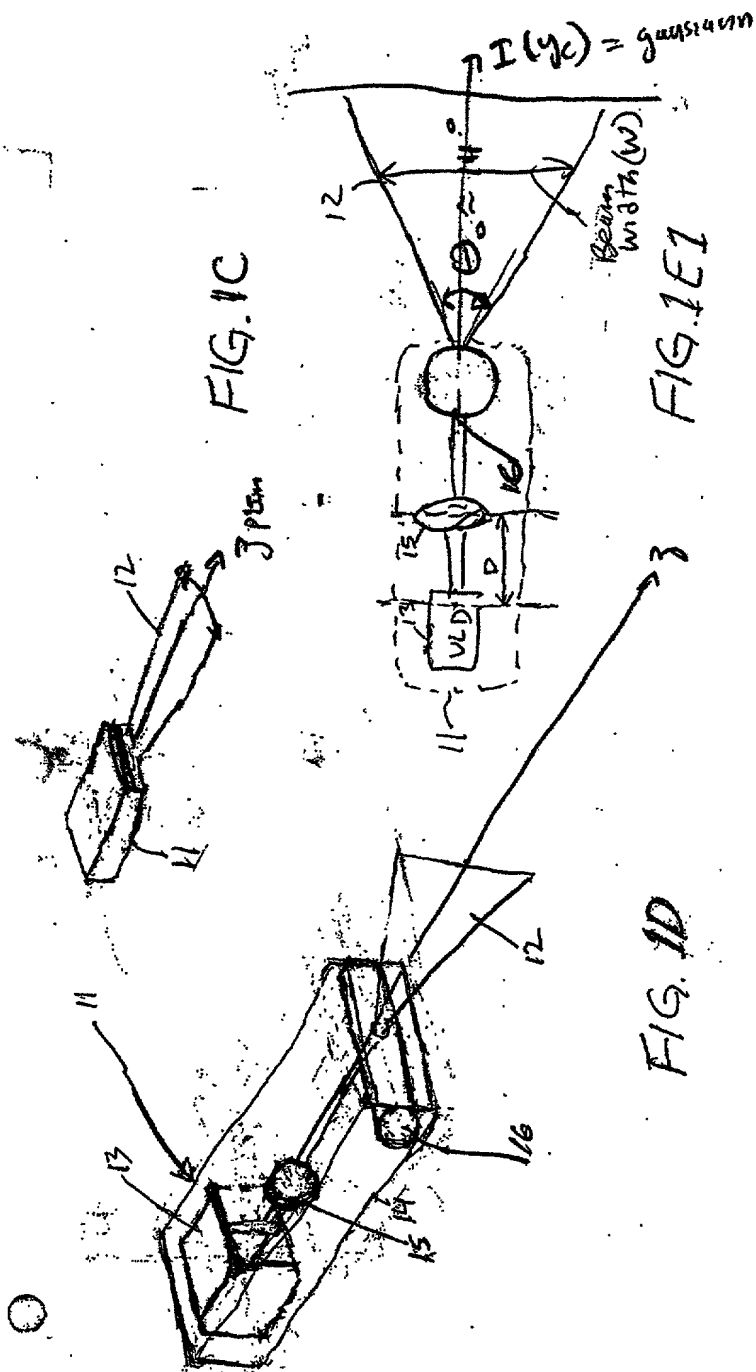
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VLD BLOCK CAN PITCH FORWARD FOR ALIGNMENT WITH OTHER VLD BEAMS







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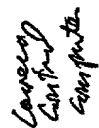
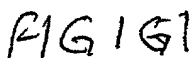


FIG. 11F

[illegible]

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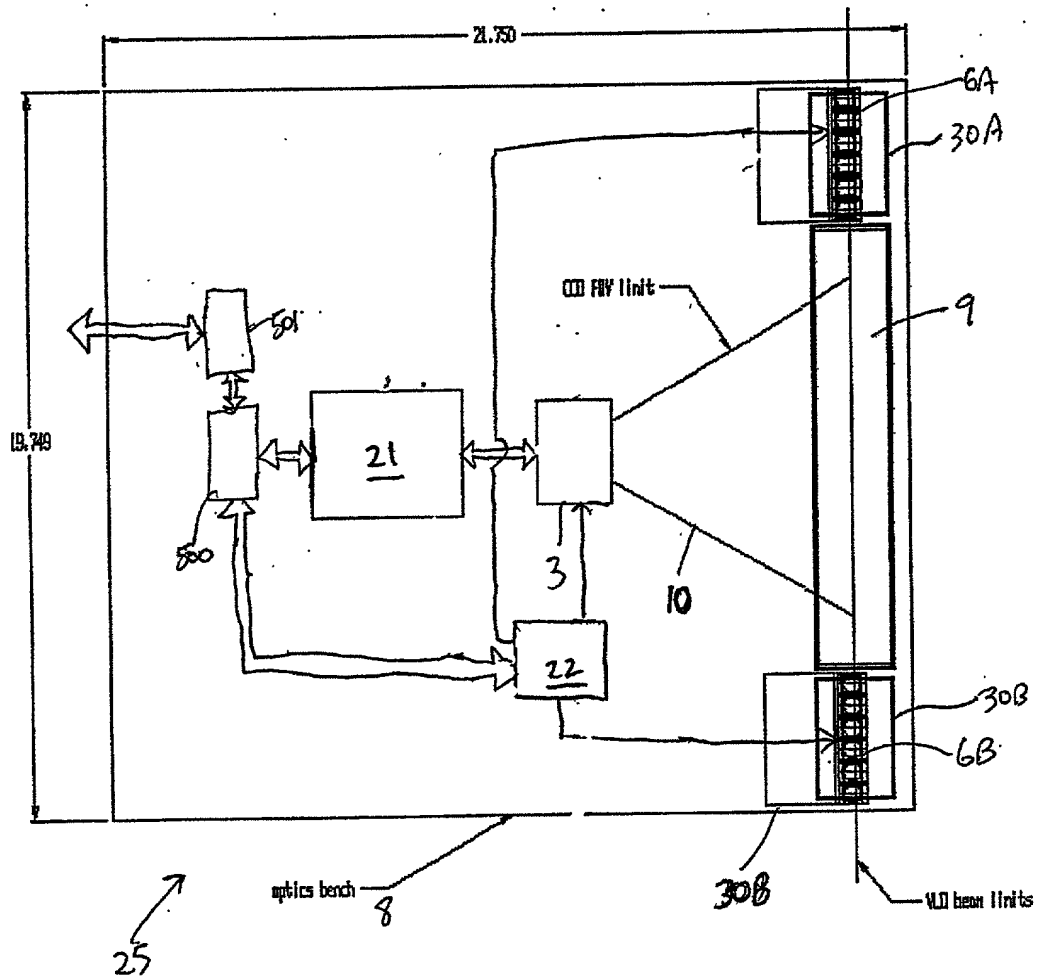


FIG. 142



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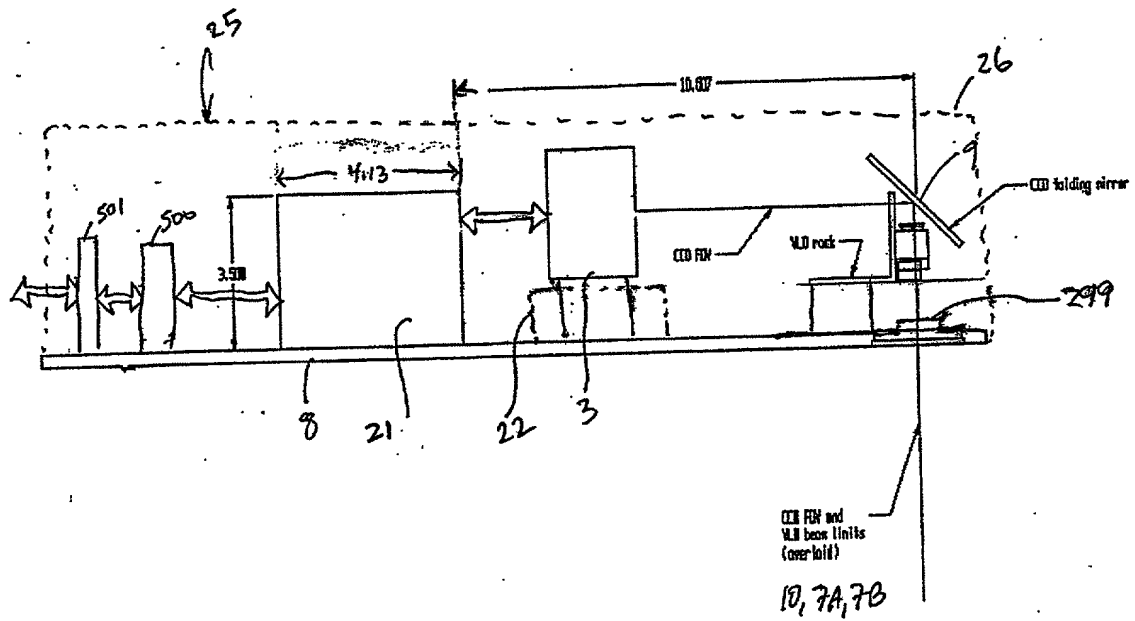
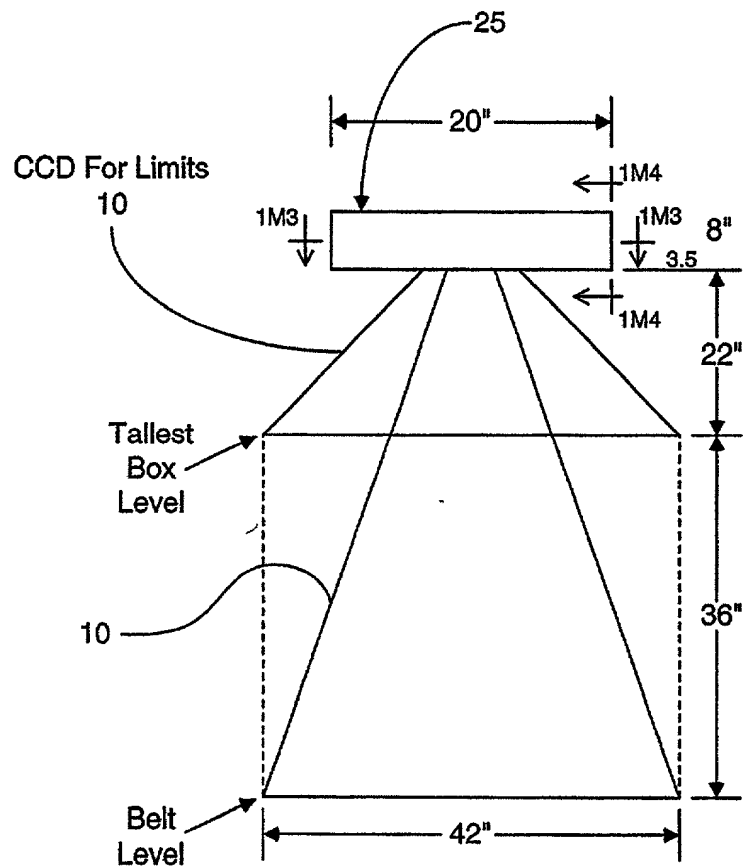


FIG. 164

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\* Fixed Field Of Field

FIG. 1G5

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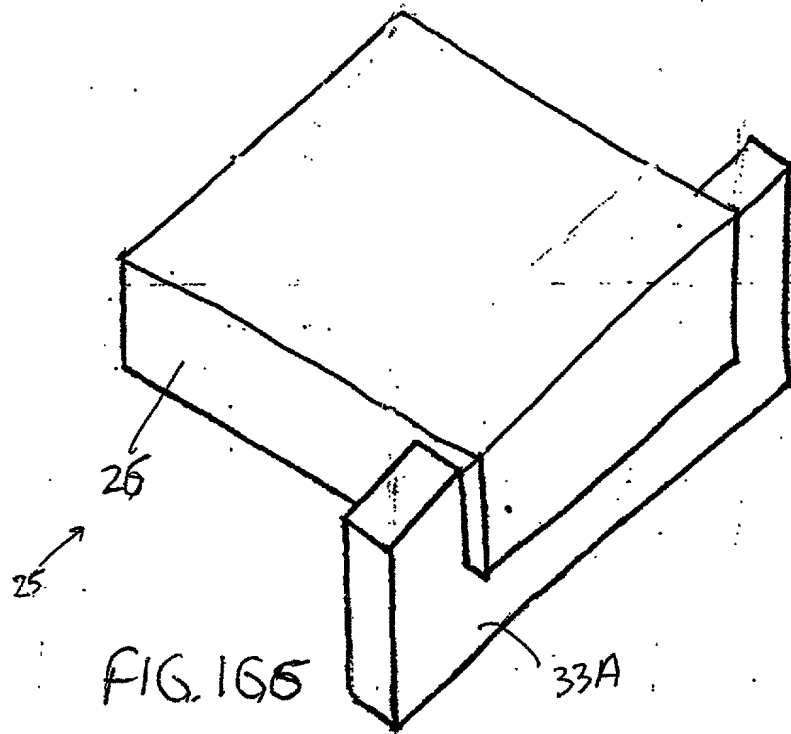


FIG. 166

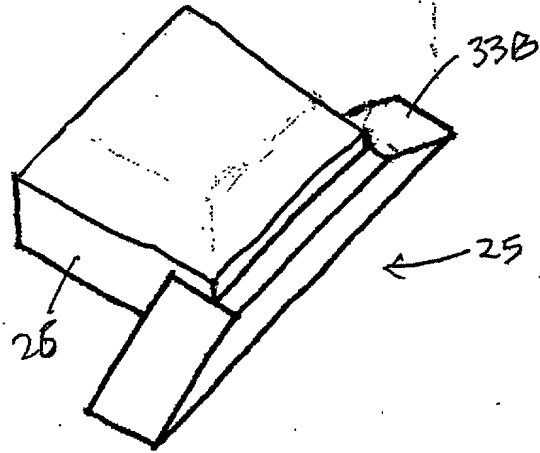


FIG. 167



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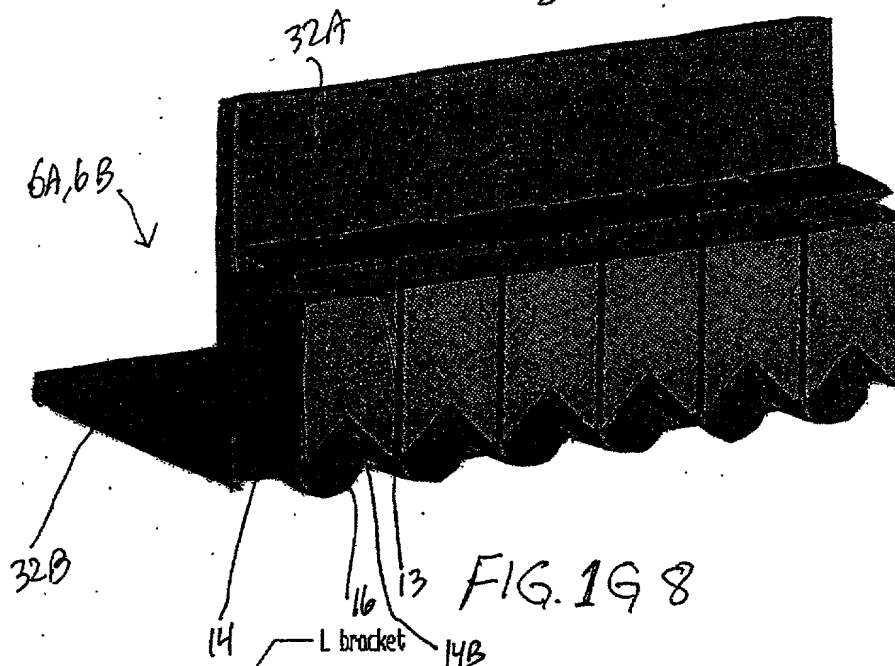


FIG. 1G8

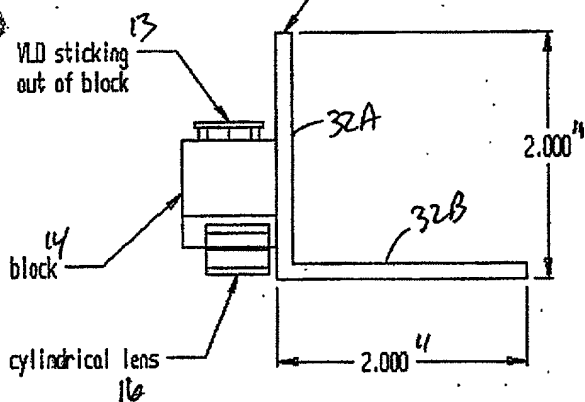


FIG. 1G9

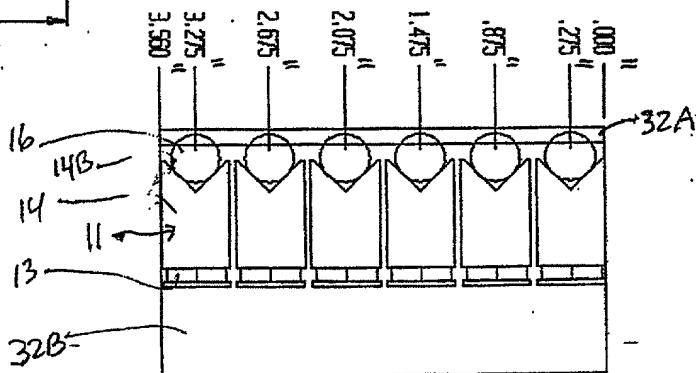
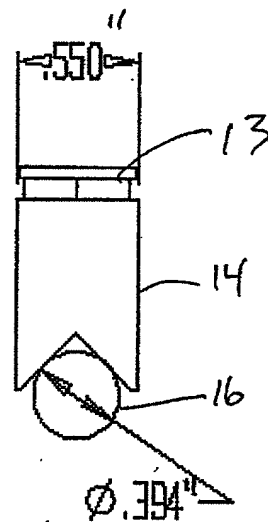
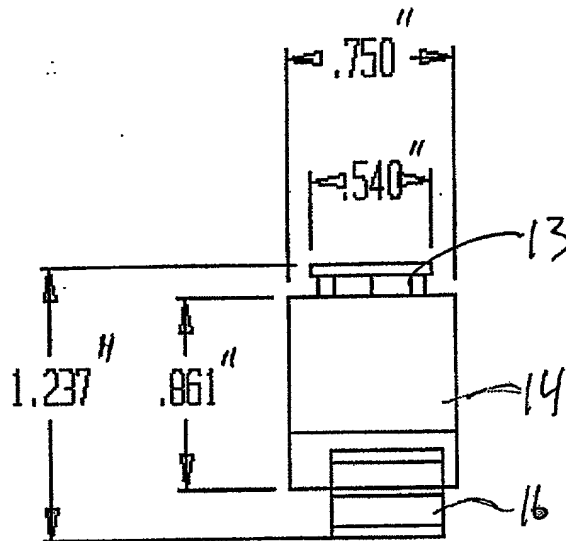


FIG. 1G10

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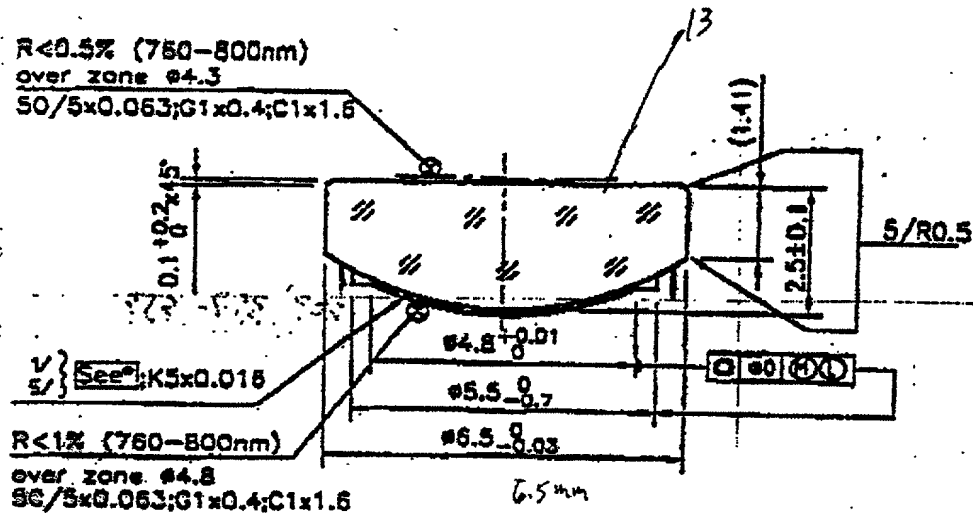


FIG. 1G13

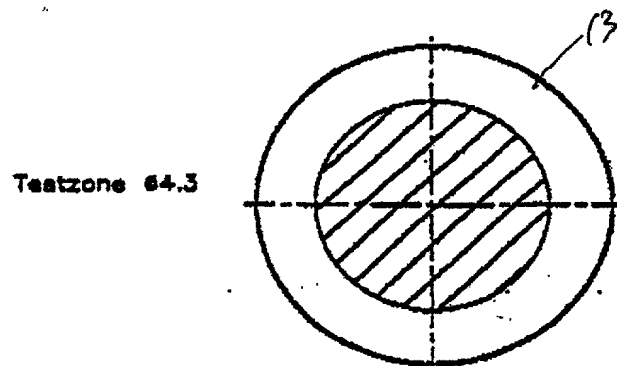


FIG. 1G14

FIG. 1G15A

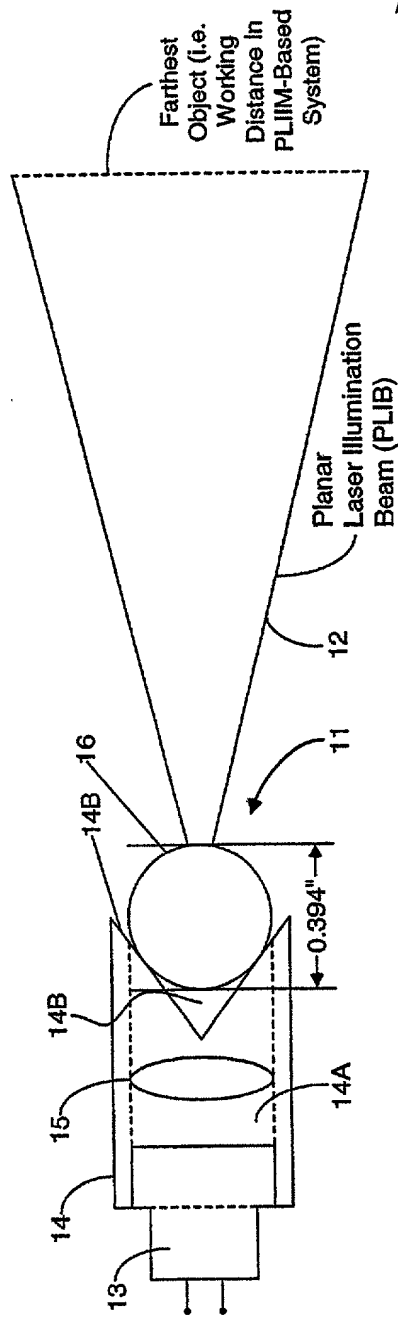


FIG. 1G15A

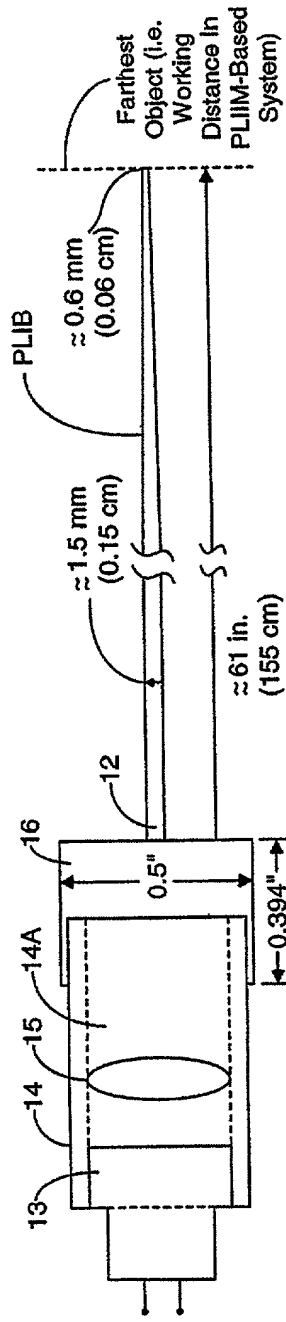


FIG. 1G15B

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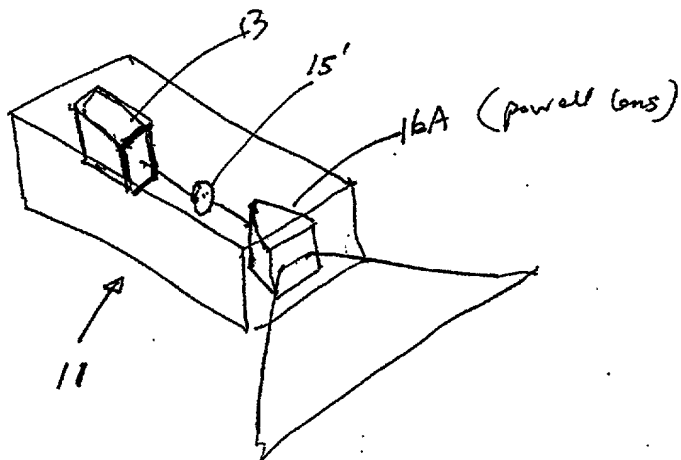


FIG. 1G.16A

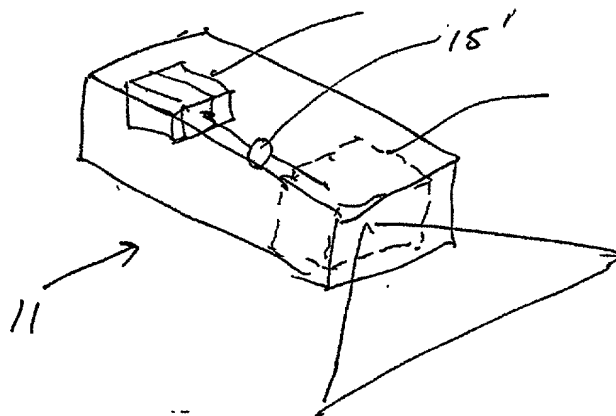


FIG. 1G.16B

• PLIM w/  
powell lens

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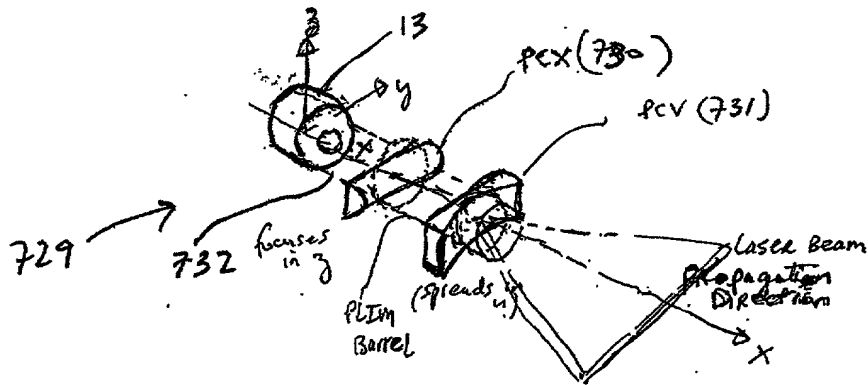


FIG. 16.17A

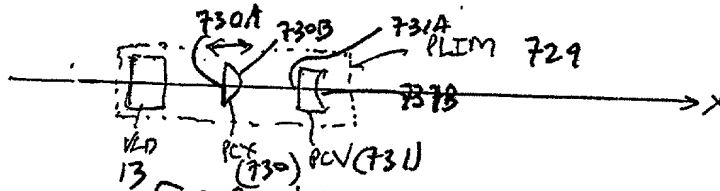


FIG. 16.17B

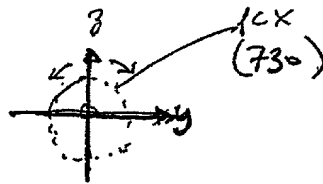


FIG. 16.17C

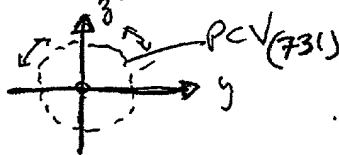


FIG. 16.17D



FIG. 16.17E

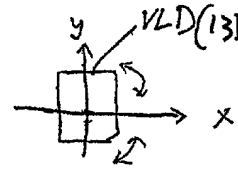
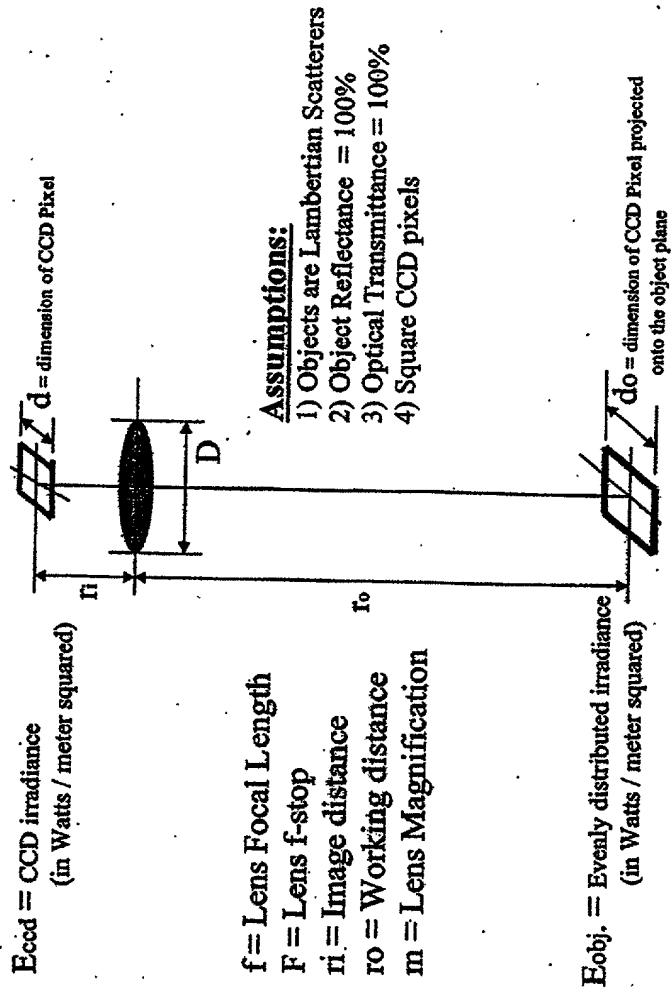


FIG. 16.17F

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**Assumptions:**

- 1) Objects are Lambertian Scatterers
- 2) Object Reflectance = 100%
- 3) Optical Transmittance = 100%
- 4) Square CCD pixels

CCD-Based Scanner

FIG. 1H6

FIRST GENERALIZED METHOD  
of Reducing Speckle-Noise  
Patterns AT Image  
Detection array OF The  
FPD Endsystem (3)

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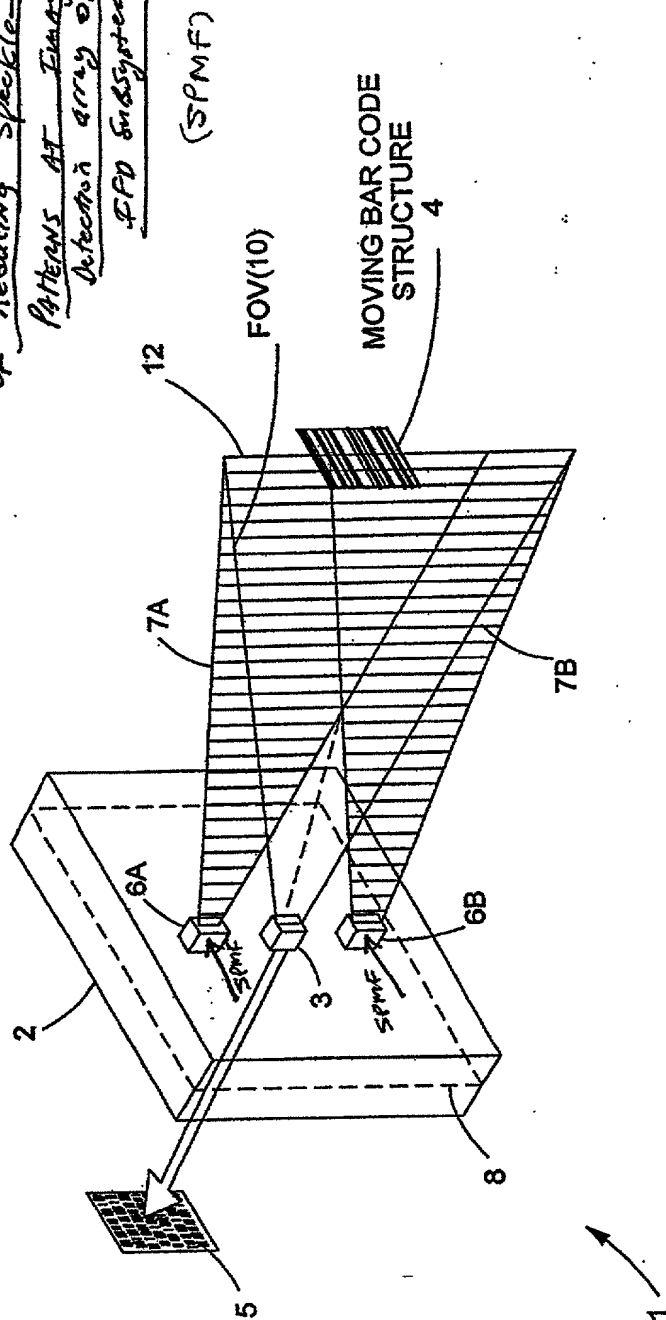
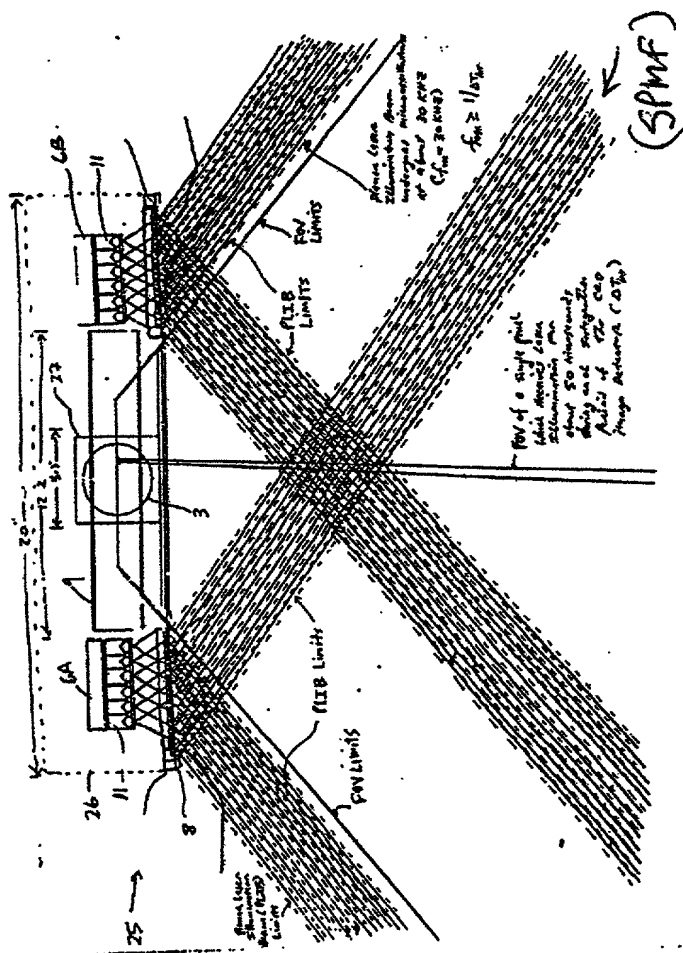


FIG. 1I1



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Prior to object illumination

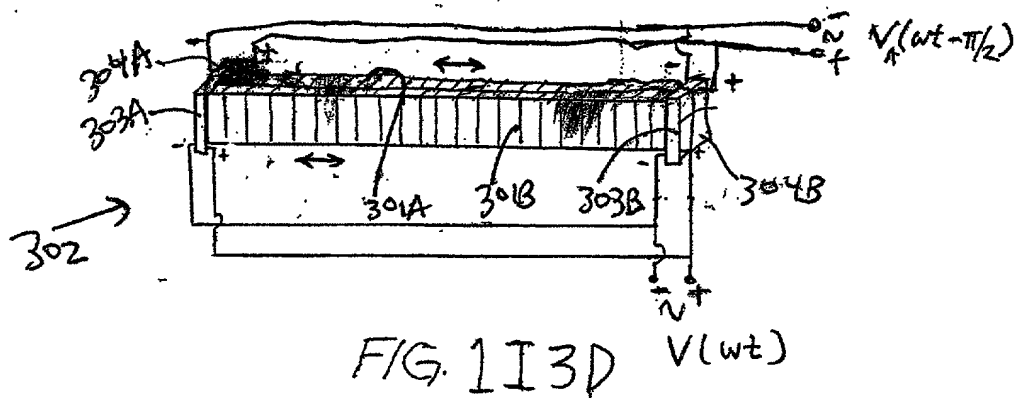
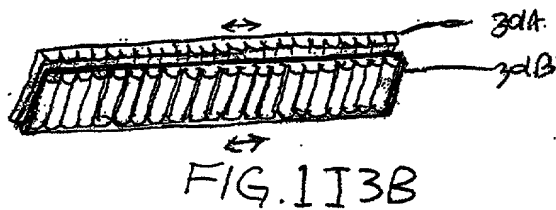
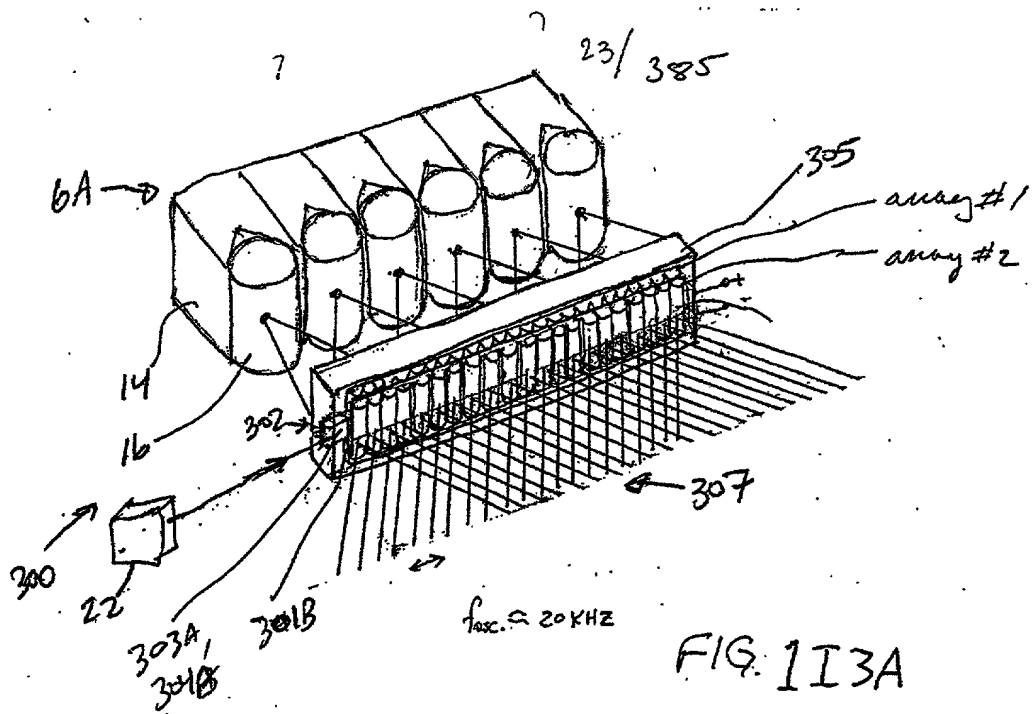
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**The First Generalized Speckle-Noise Pattern Reduction Method**  
**Of The Present Invention**

Prior to illumination of the target with the planar laser illumination beam (PLIB), modulate the spatial phase of the transmitted PLIB along the planar extent thereof according to a spatial phase modulation function (SPMF) so as to produce numerous substantially different time-varying speckle-noise patterns at the image detection array of the IFD Subsystem during the photo-integration time period thereof.

Temporally average the numerous substantially different time-varying speckle-noise patterns produced at the image detection array in the IFD Subsystem during the photo-integration time period thereof, so as to thereby reduce the power of the speckle-noise pattern observed at the image detection array.

FIG. 1I2B



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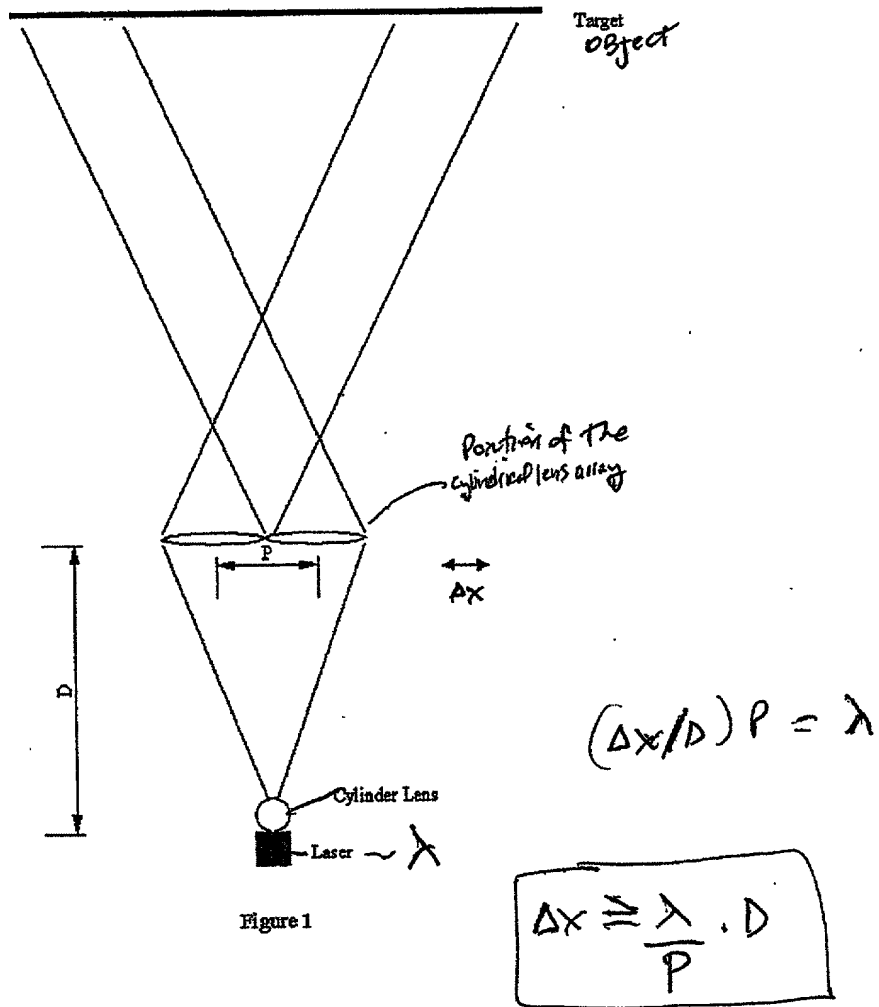
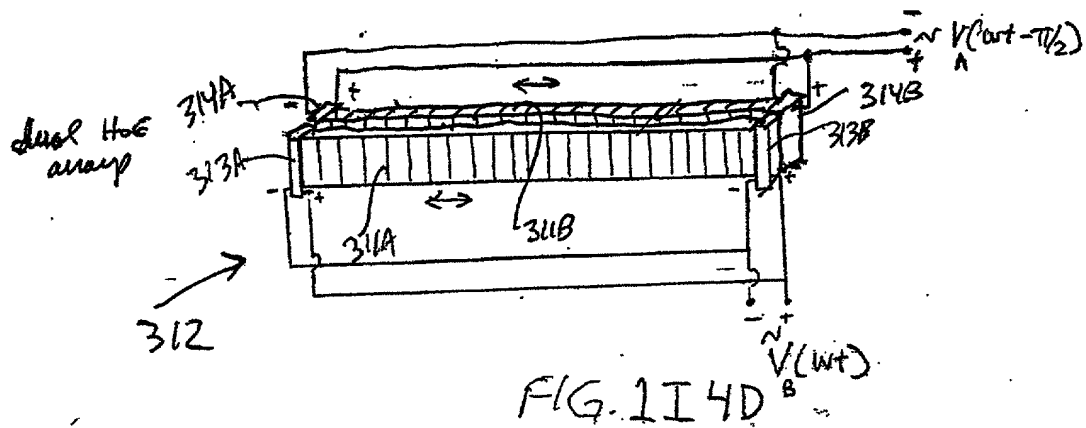
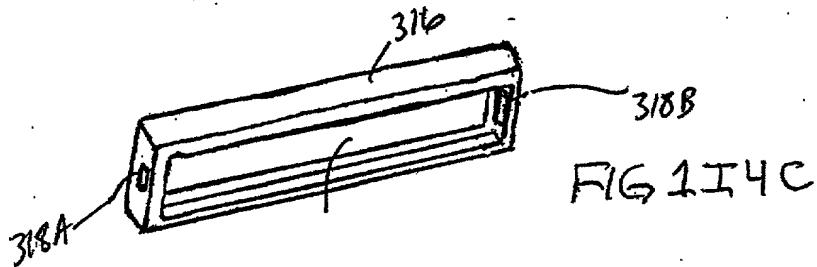
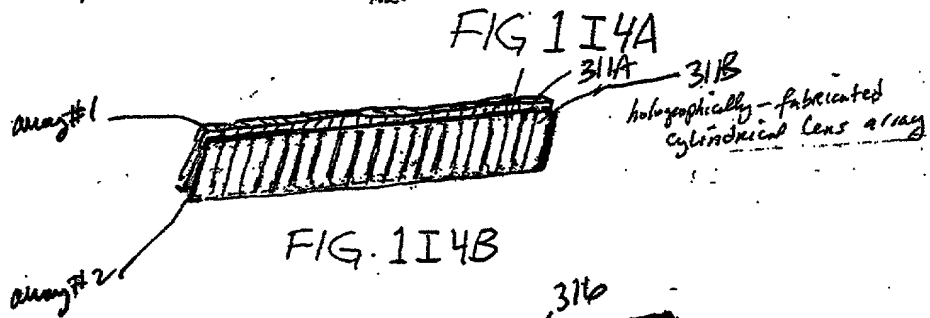
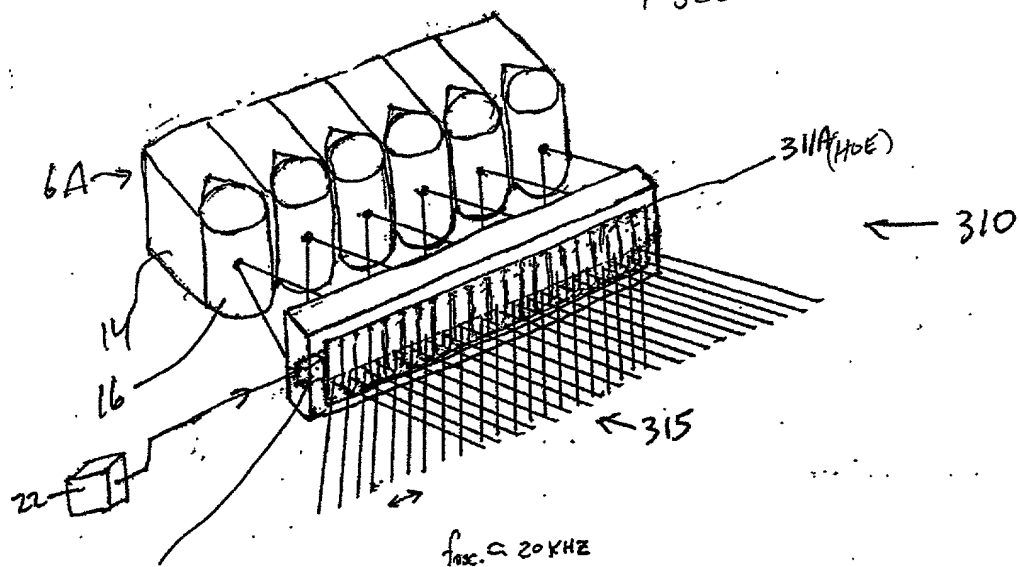


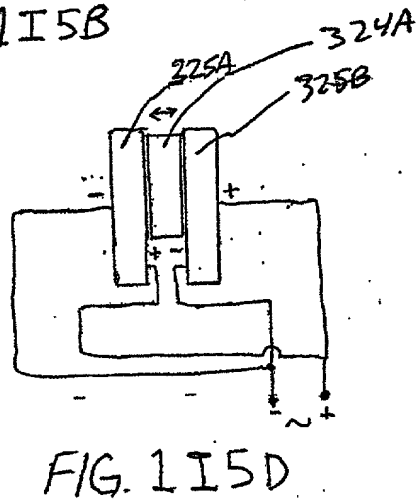
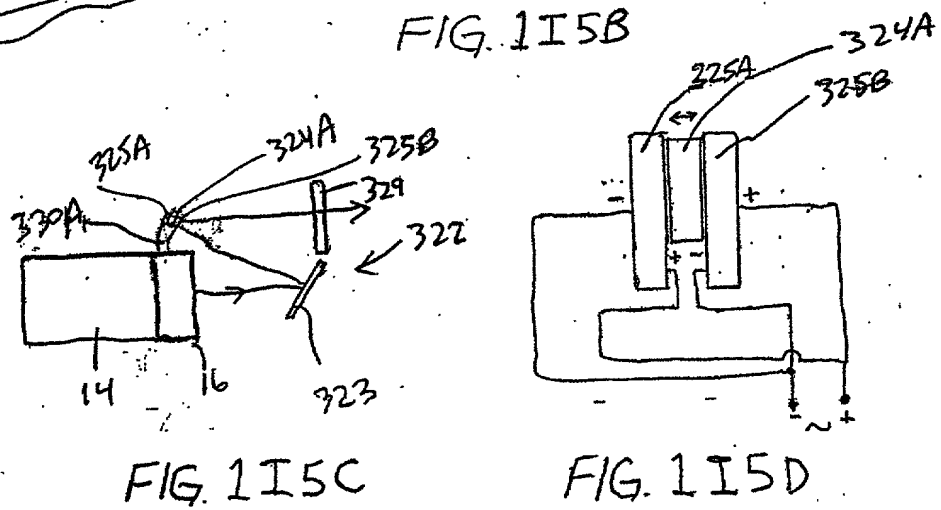
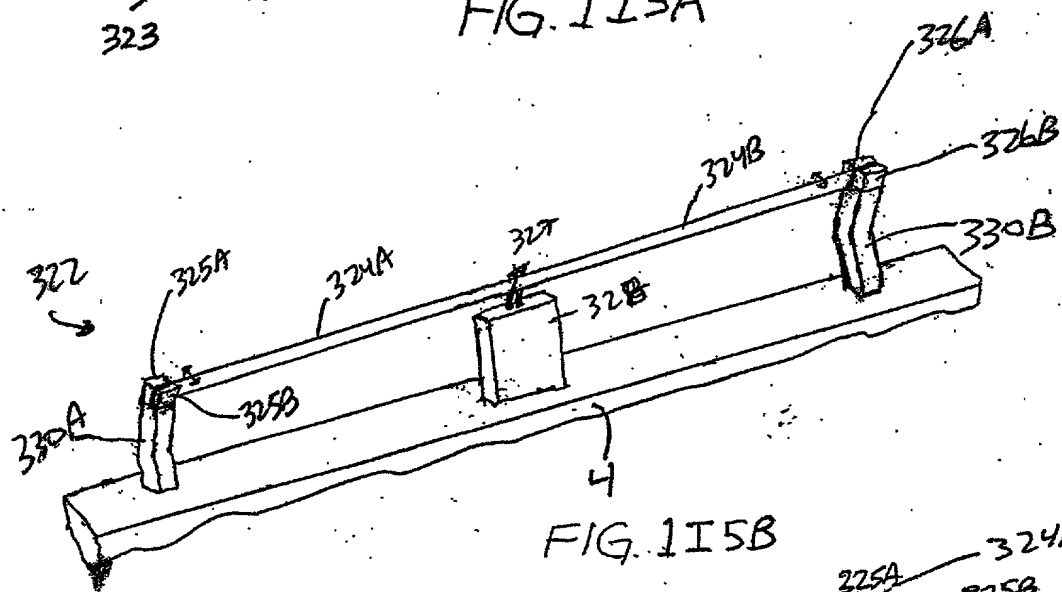
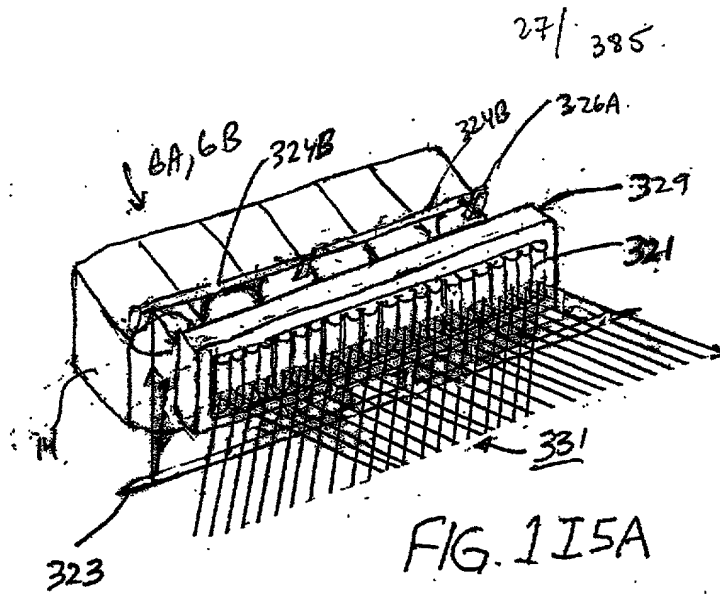
Figure 1

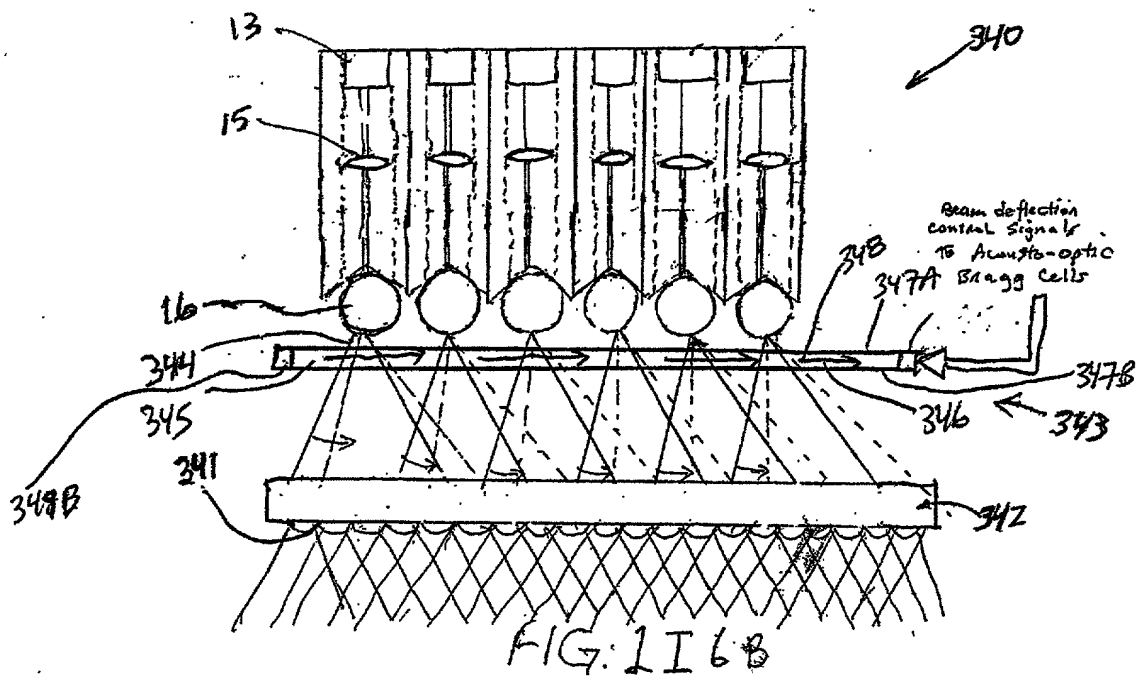
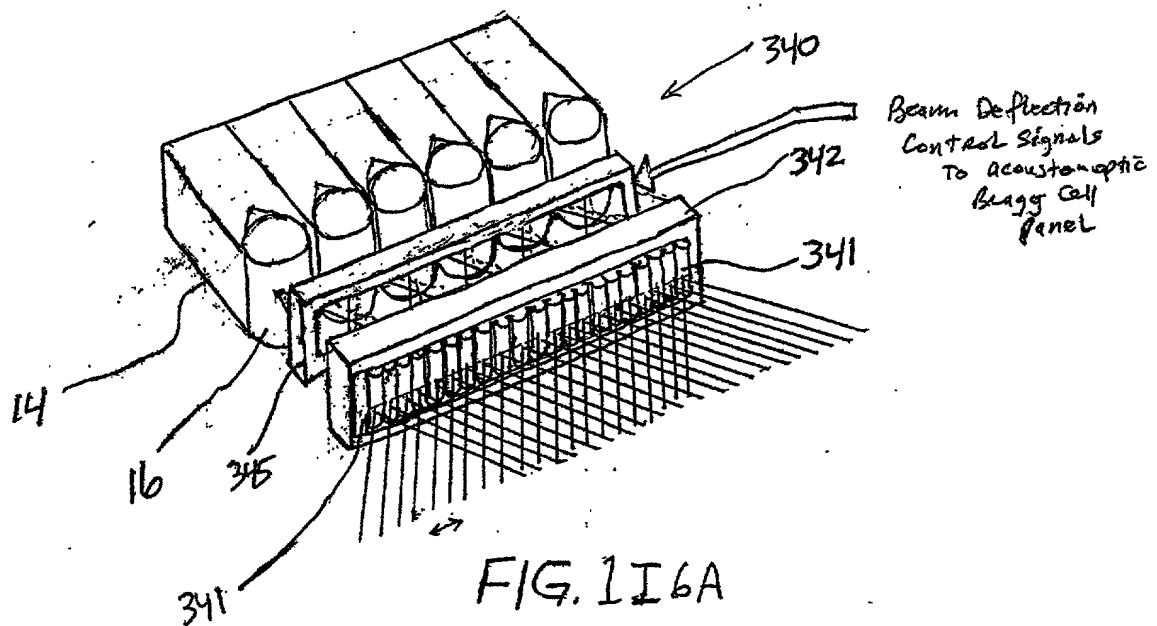
FIG. 1I3E



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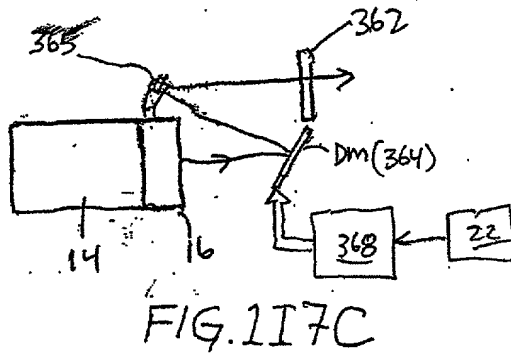
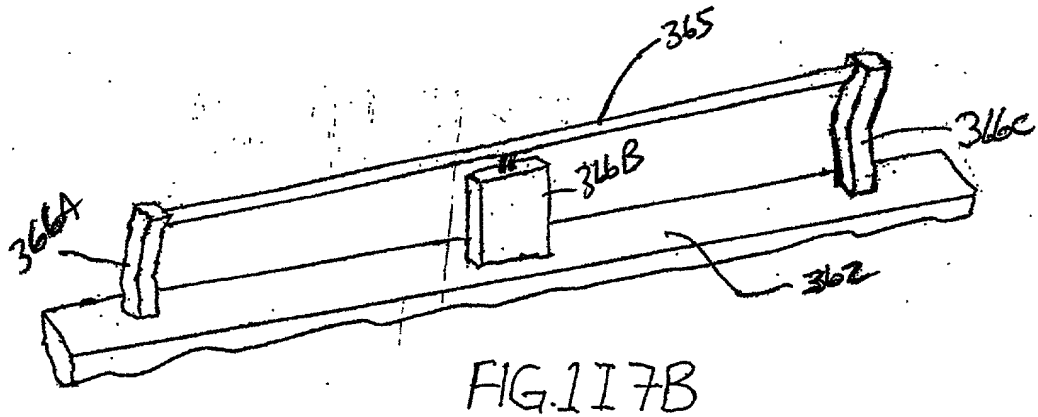
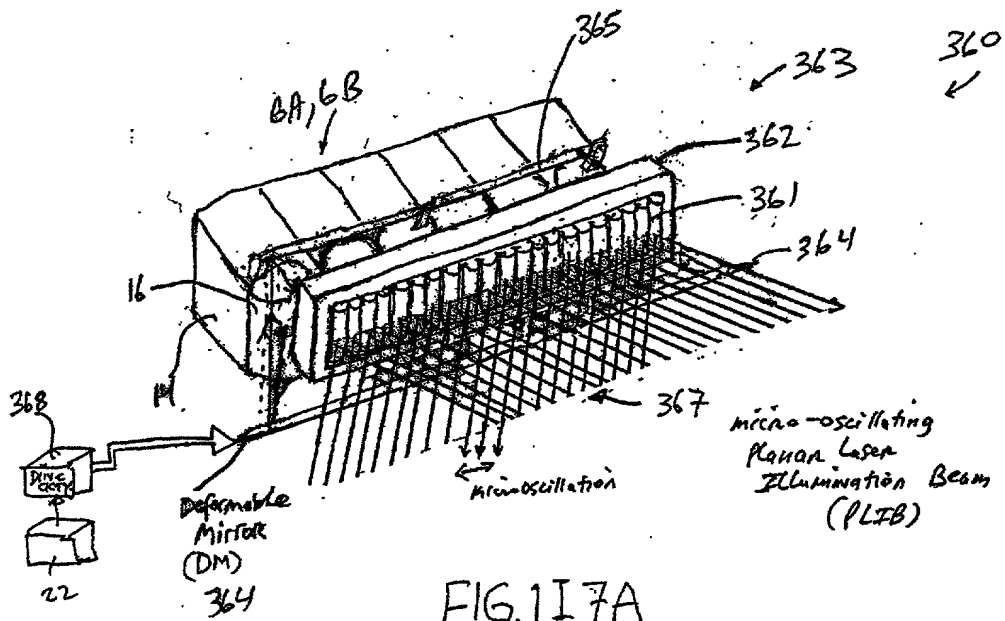


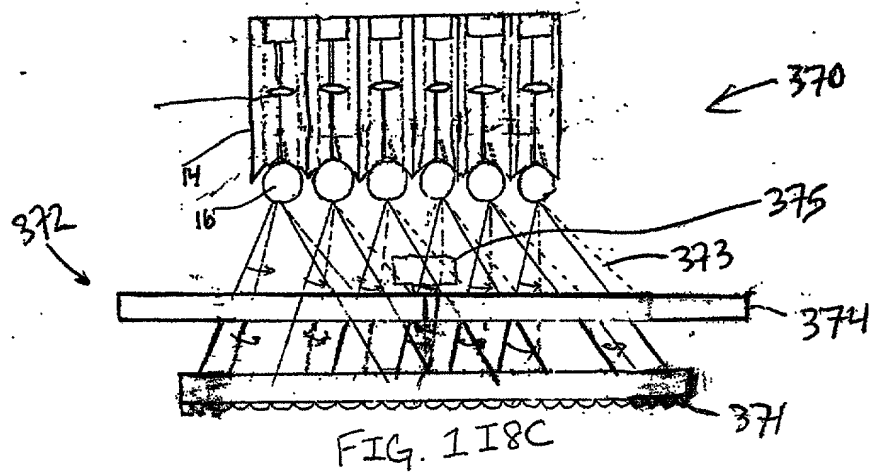
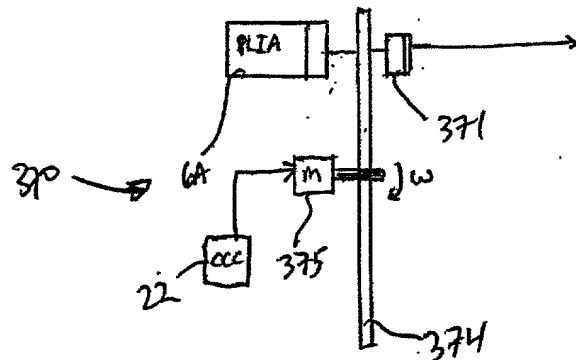
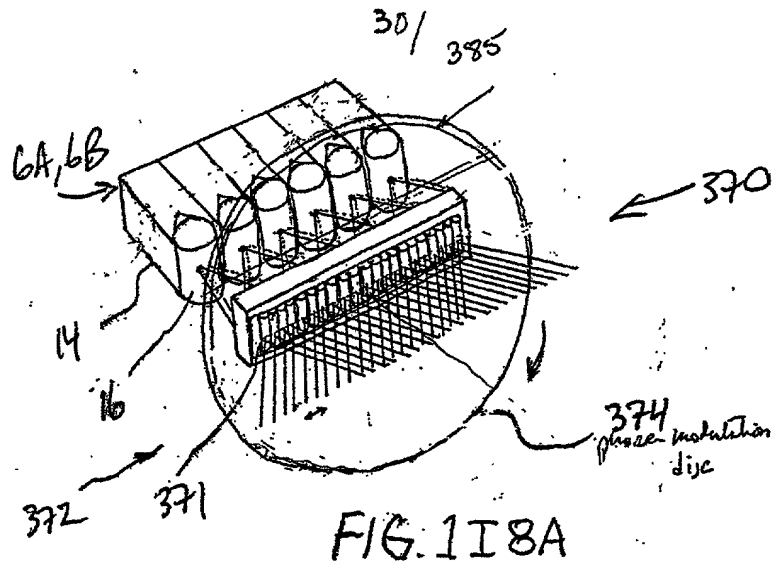
[illegible]



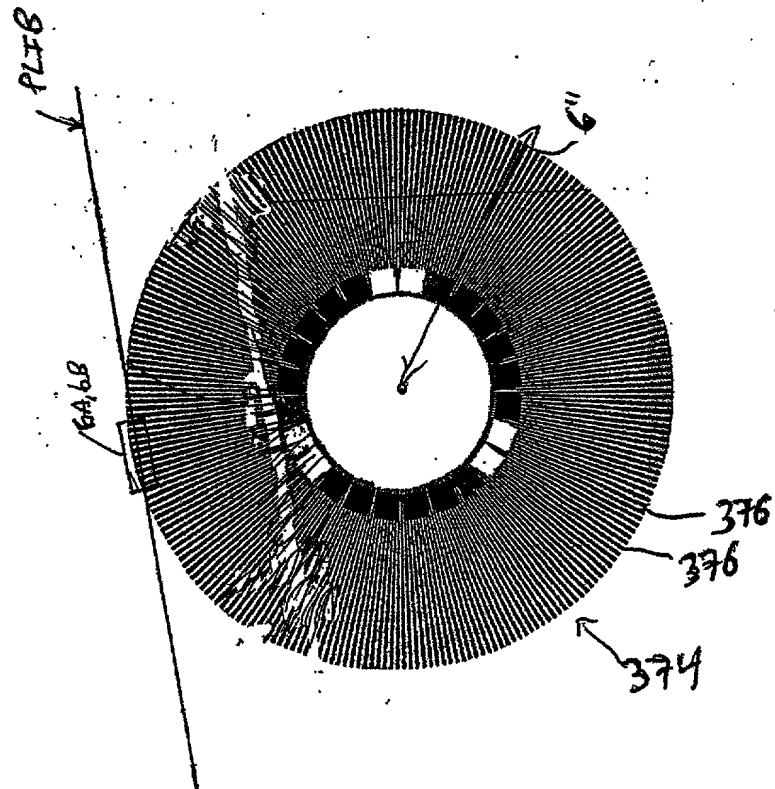
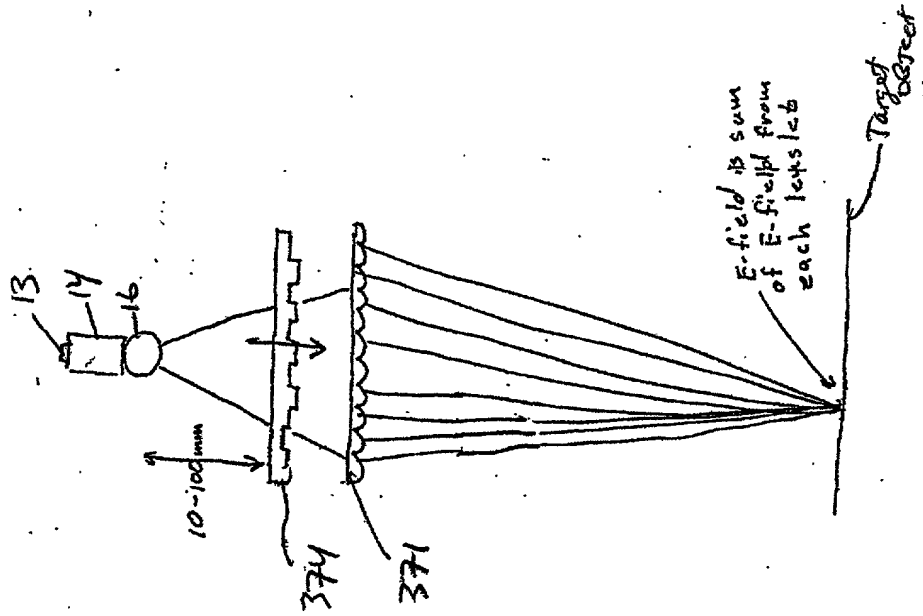


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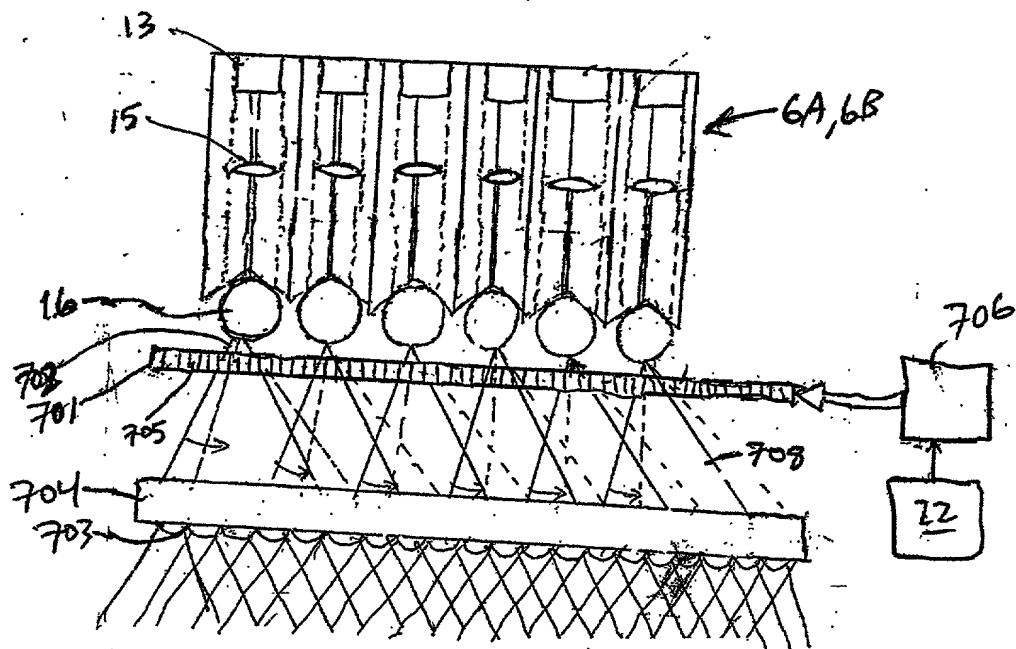
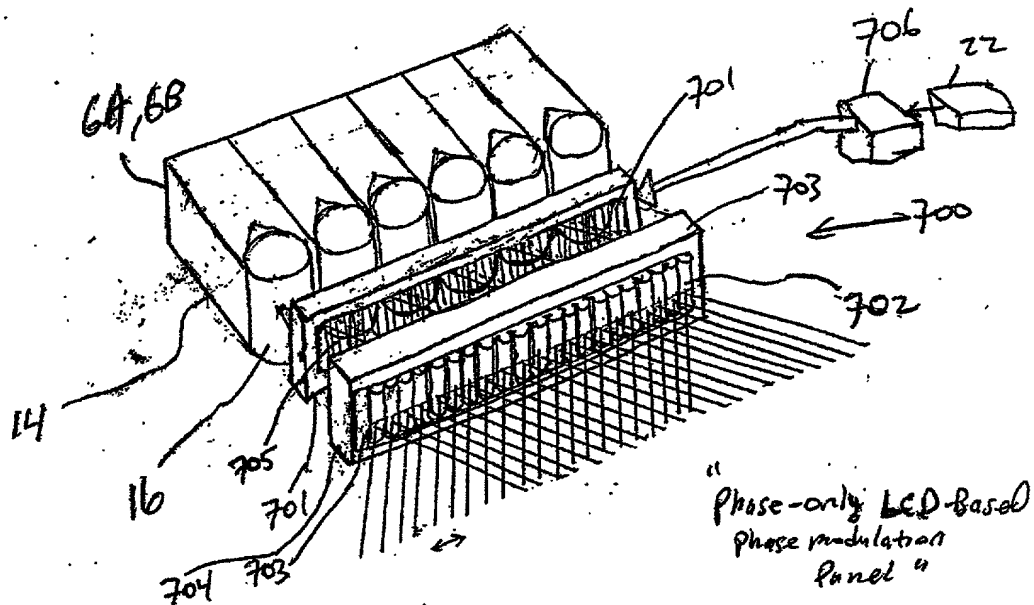




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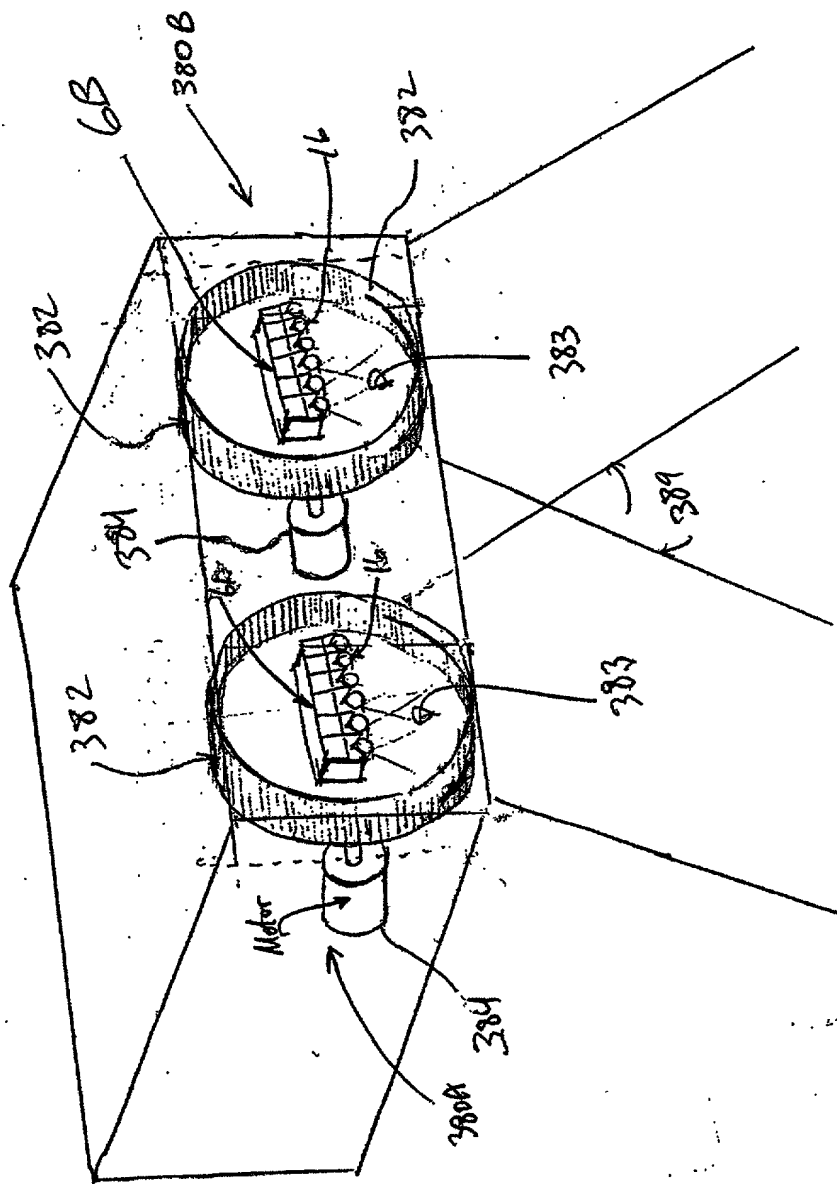


FIG. 1I 9A

Optical specifications:

- 30 cylindrical lens (lenses) per linear inch
- focal length  $\approx 2.0$  millimeters
- diameter of lens holder carousel  $\approx 4$  inches
- acrylic material

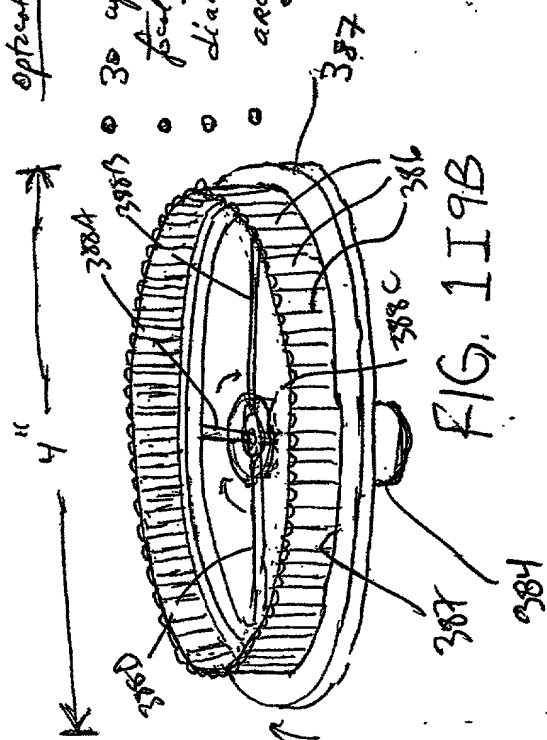


FIG. 119B

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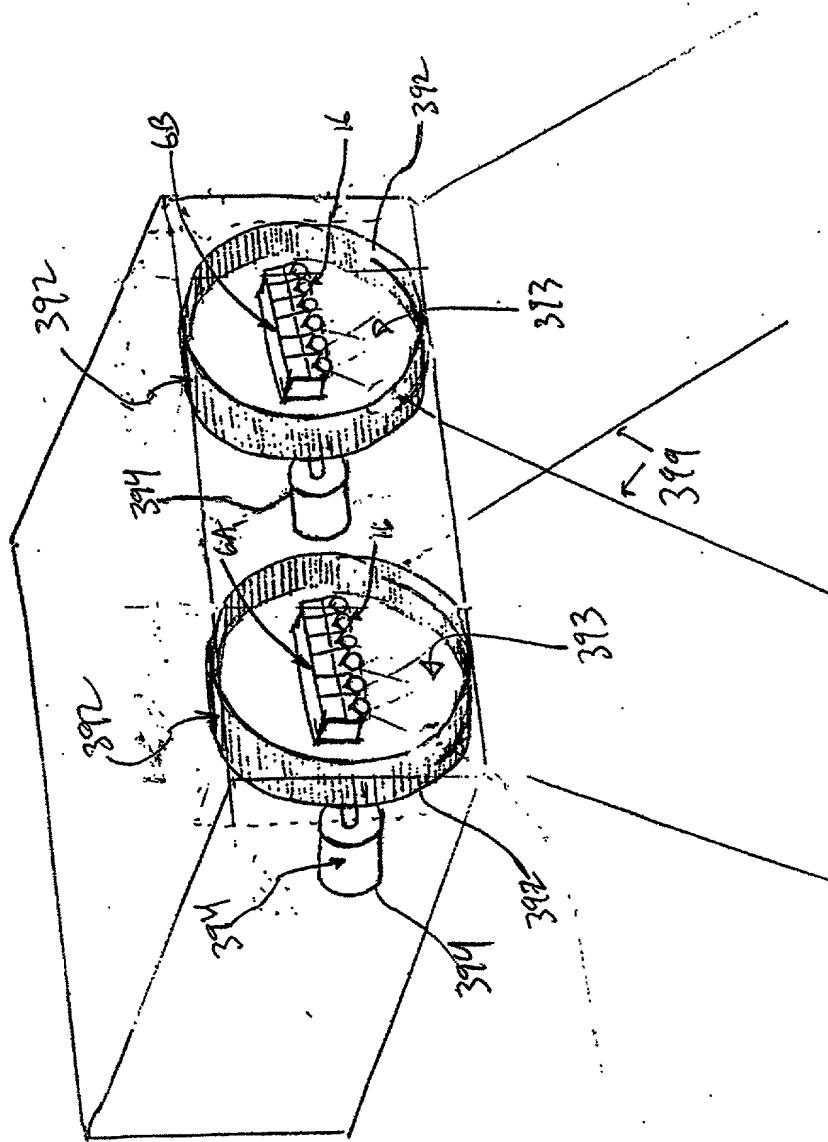
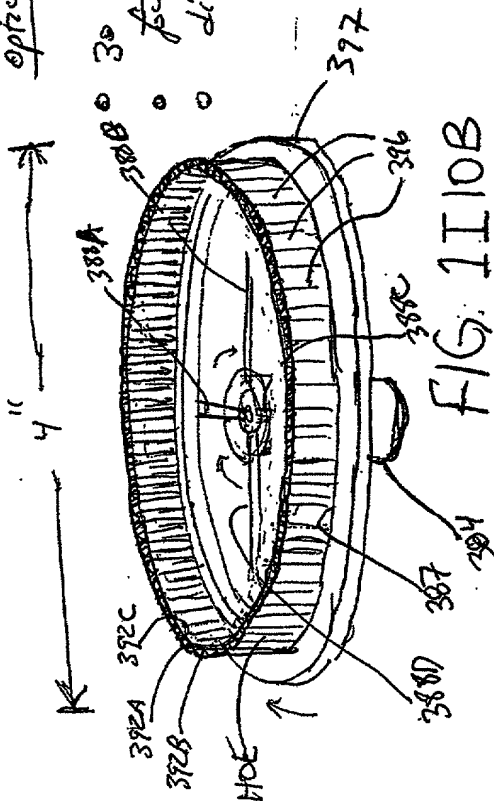


FIG. 1110A

Optical specifications:

- 30 upturned lens (lines) per linear inch
- foil length: 2.0 millimeters
- diameter of cathode carousel  $\approx 4$  inches





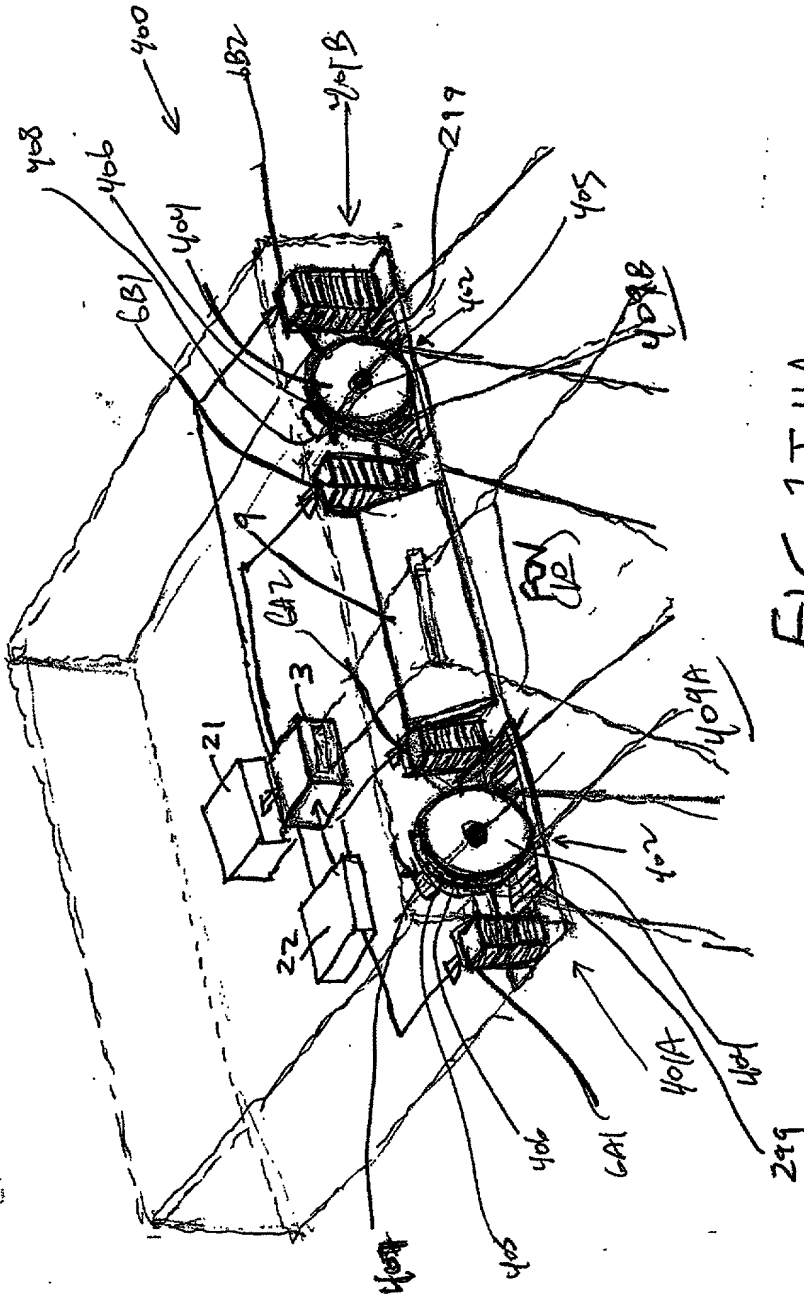


FIG. 1I IIA

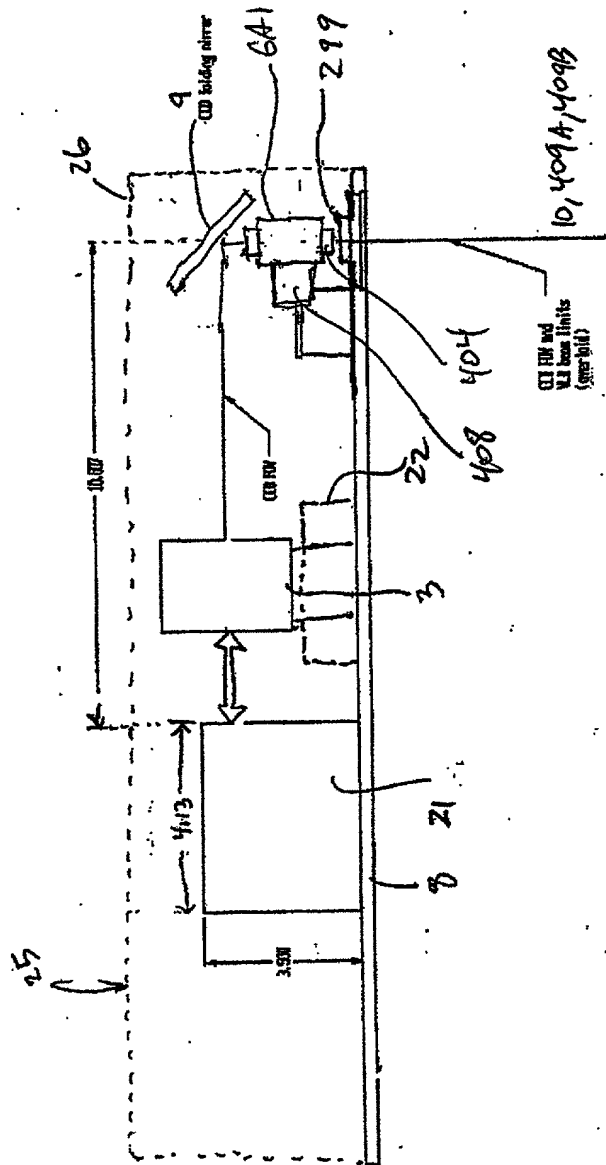


FIG. 1 I 1/B

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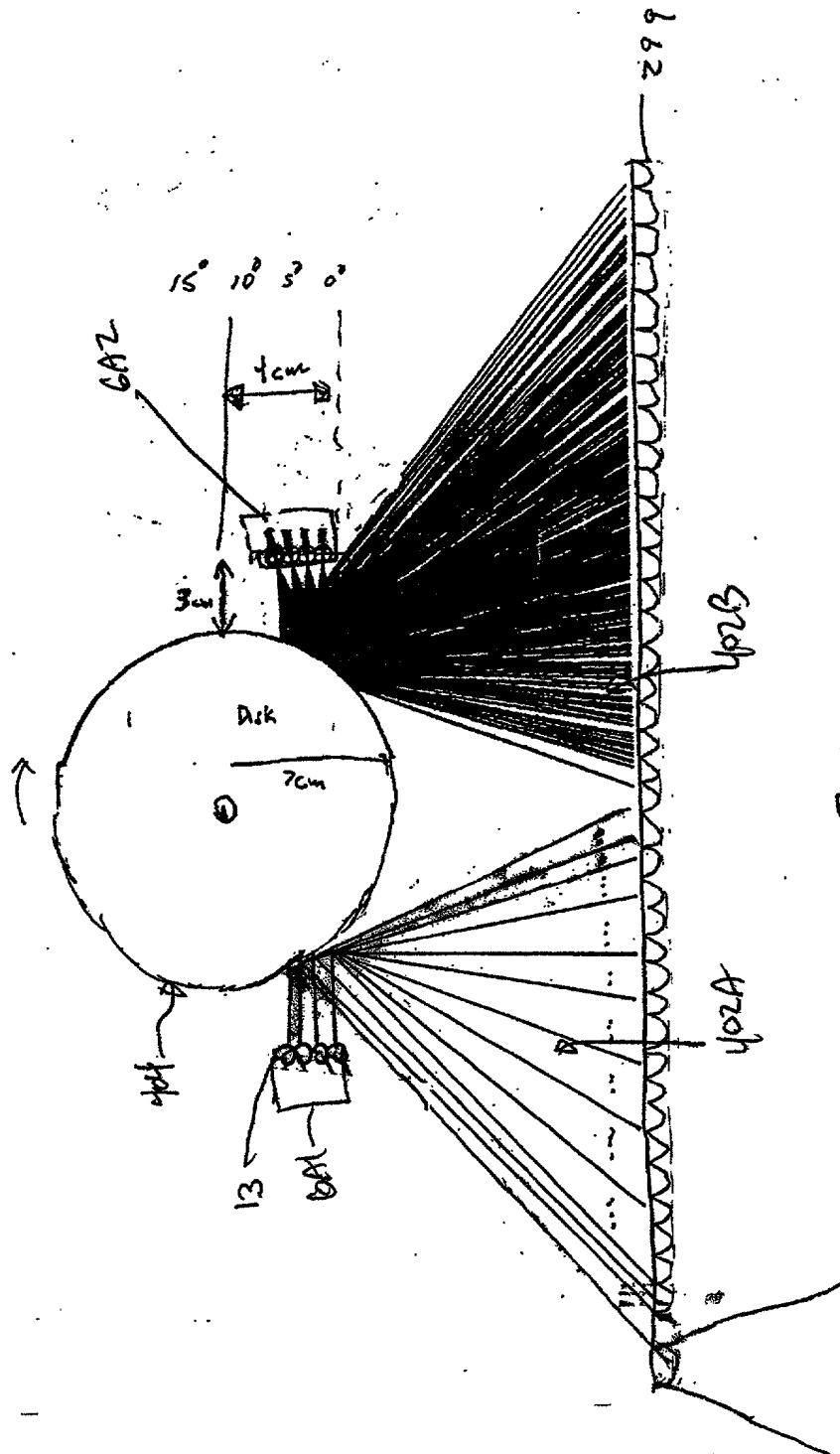


FIG. 1I11C

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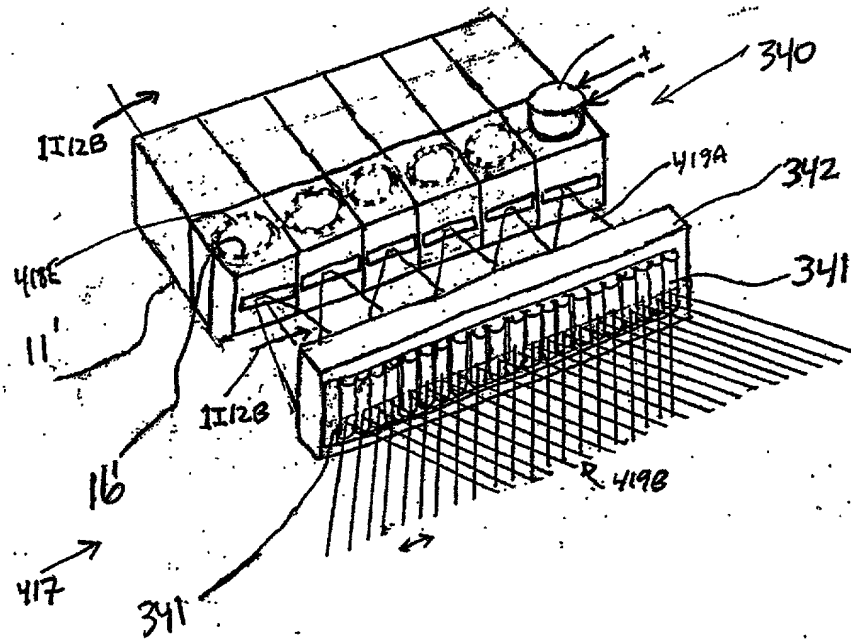


FIG. 1I12A

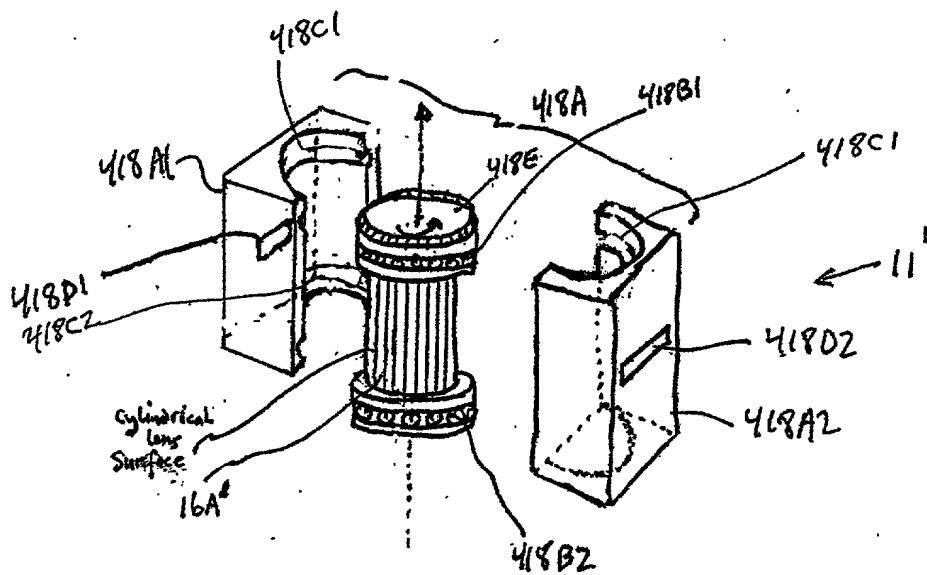


FIG. 1I12B

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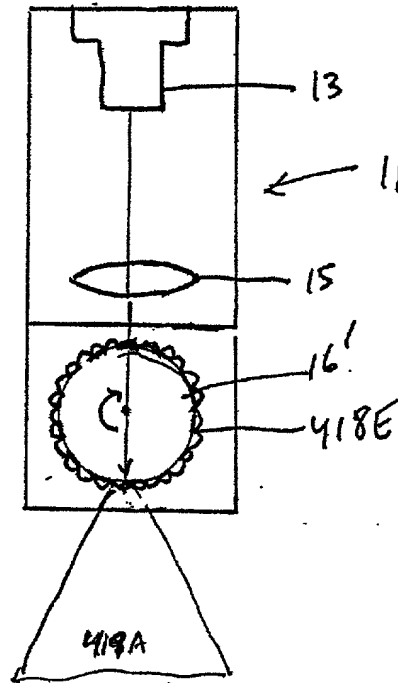


FIG. 1I12C

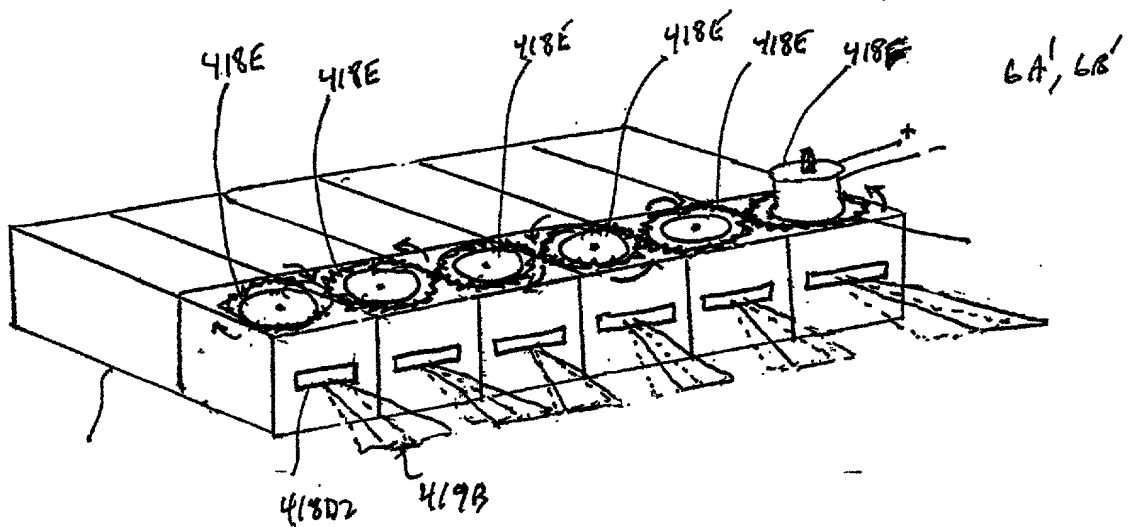


FIG. 1I12D

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Second Generalized Method of  
Reducing Speckle-Noise Patterns  
at Image Detection Array  
of the FPD Subsystem (3)

(TIME)

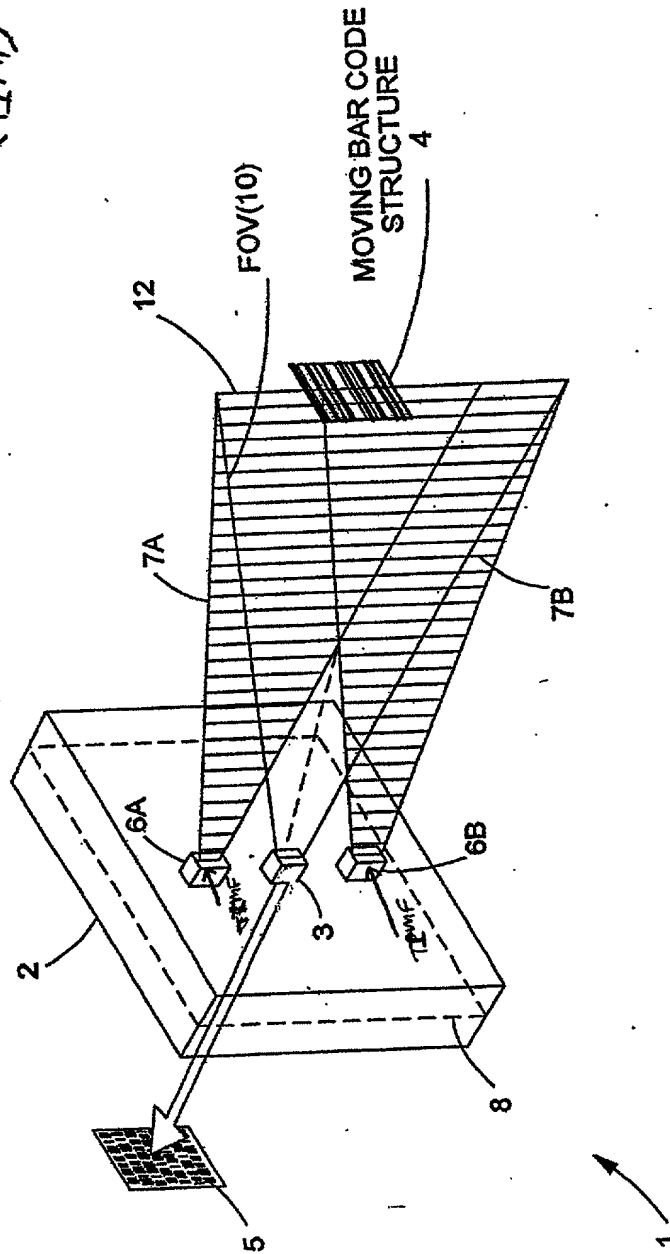


FIG. 11/13

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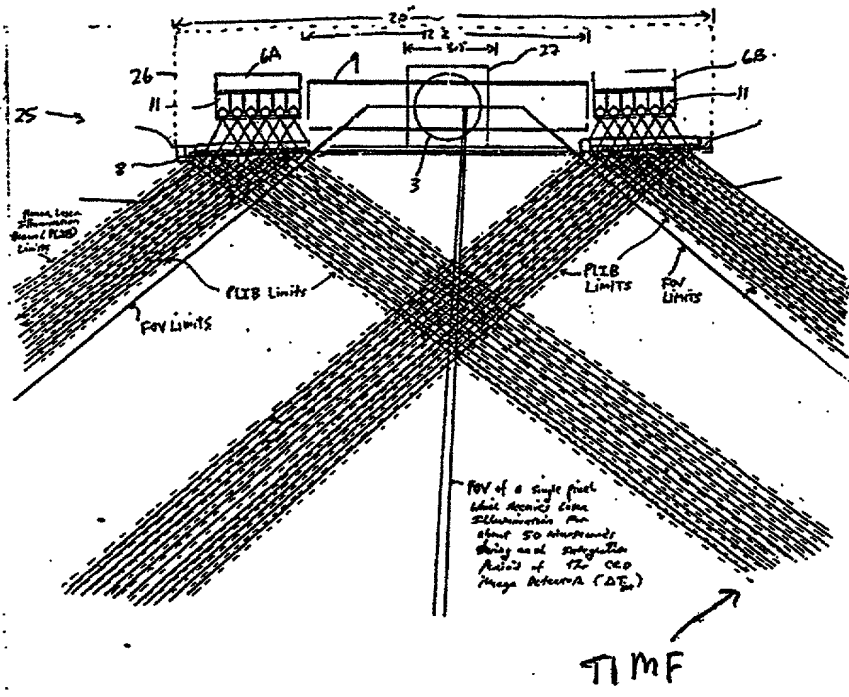


FIG. 1 I 13A

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The Second Generalized Speckle-Noise Pattern Reduction Method  
Of The Present Invention

Prior to illumination of the target with the planar laser illumination beam (PLIB), modulate the temporal intensity of the transmitted PLIB along the planar extent thereof according to a temporal intensity modulation function (TIMF) so as to

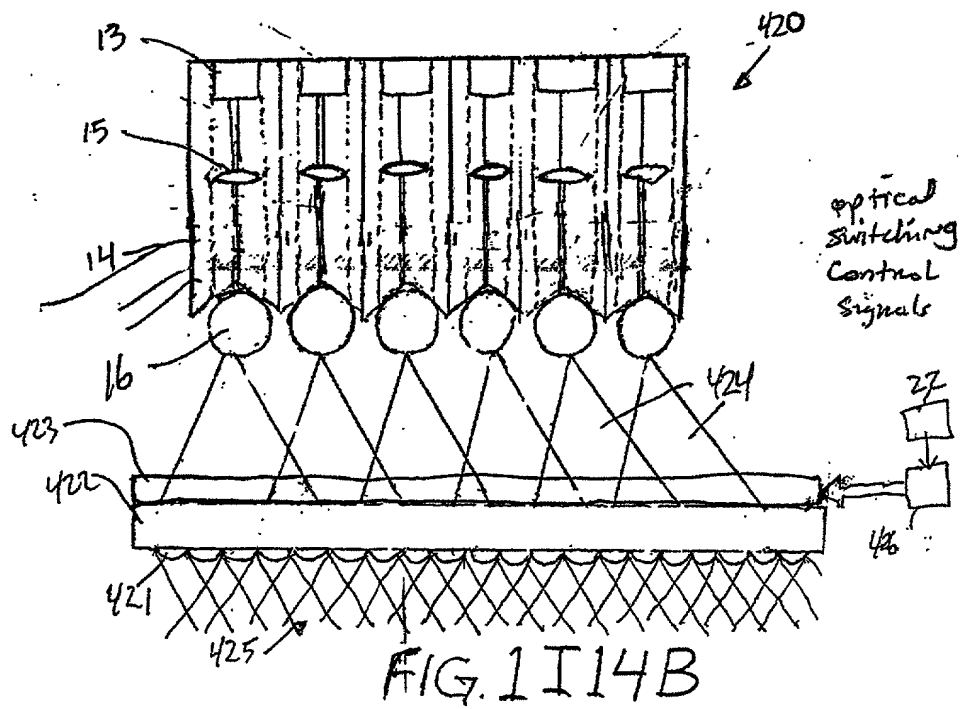
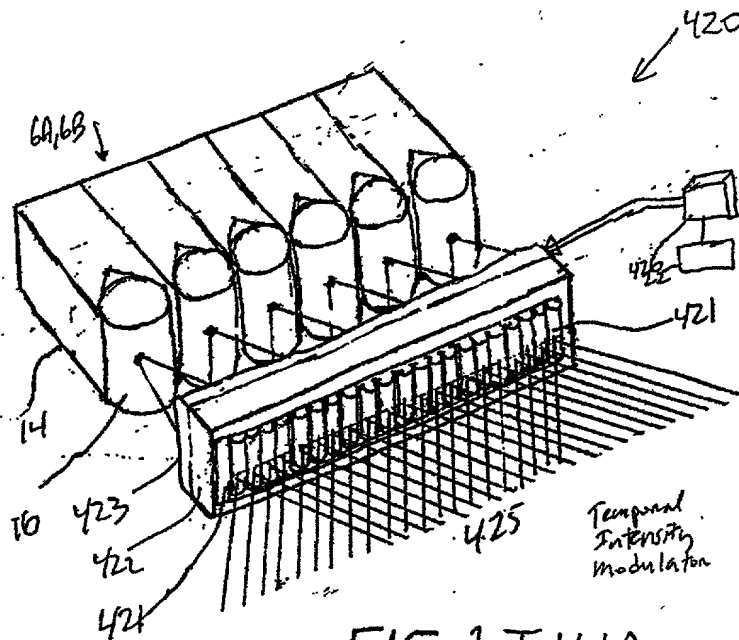
produce numerous substantially different time-varying speckle-noise patterns at the image detection array of the IFD Subsystem during the photo-integration time period thereof.

Temporally average the numerous substantially different time-varying speckle-noise patterns produced at the image detection array in the IFD Subsystem during the photo-integration time period thereof, so as to thereby reduce power of the speckle-noise pattern observed at the image detection array.

FIG. 1I13B



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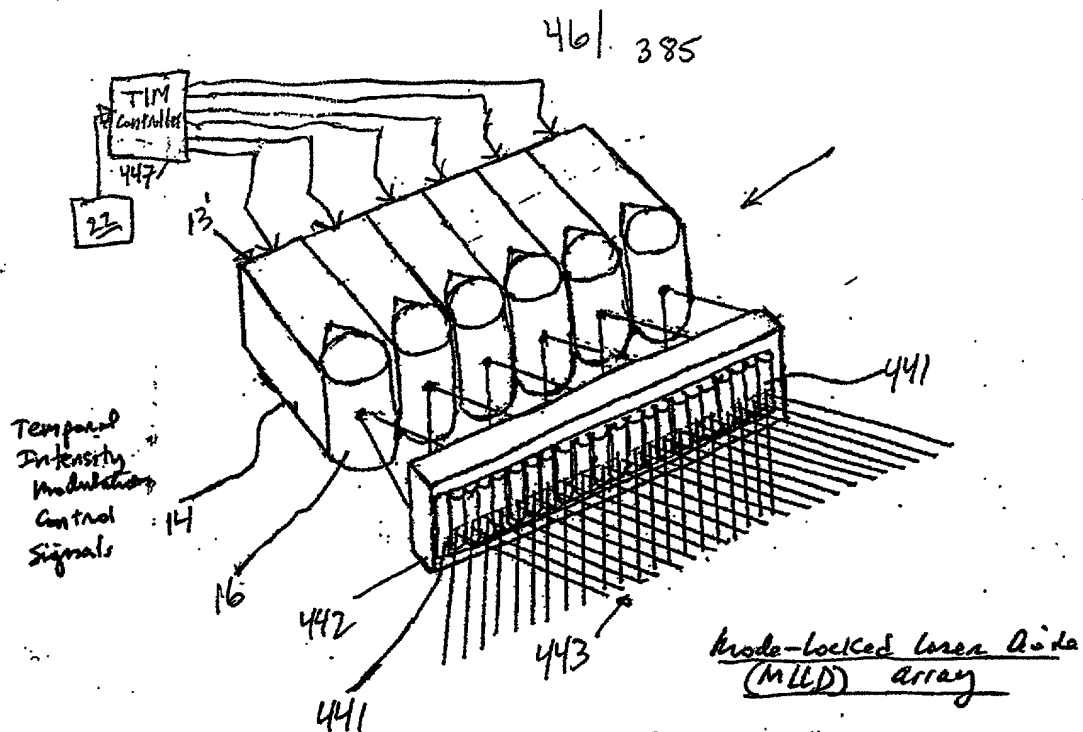


FIG. 1I15A

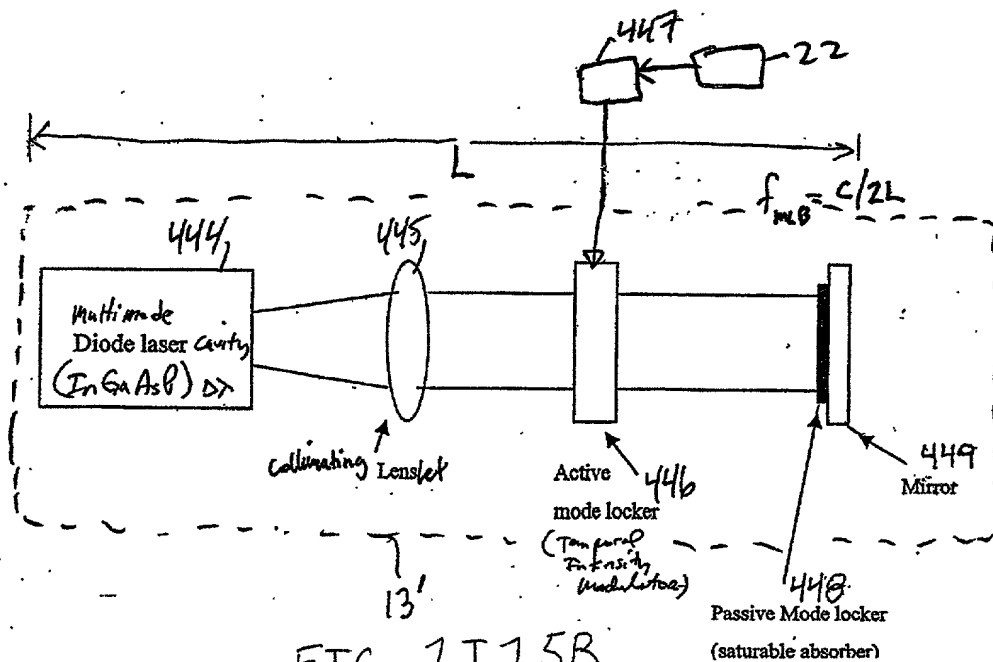
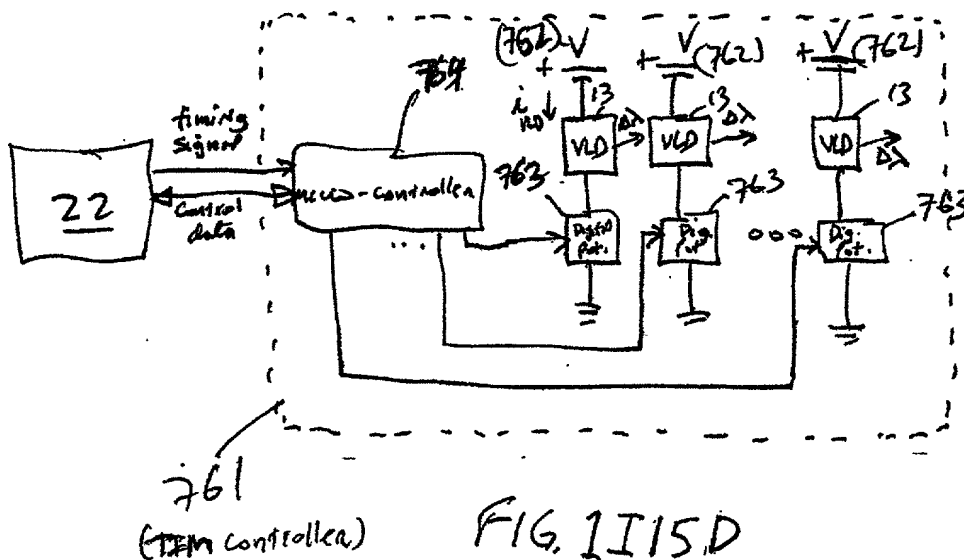
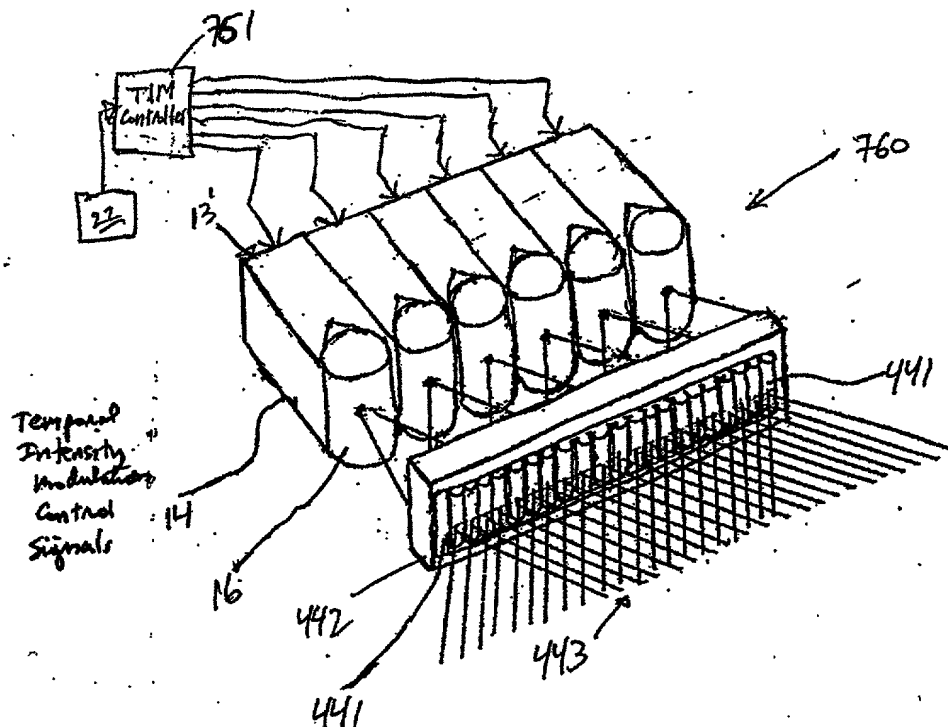


FIG. 1I15B

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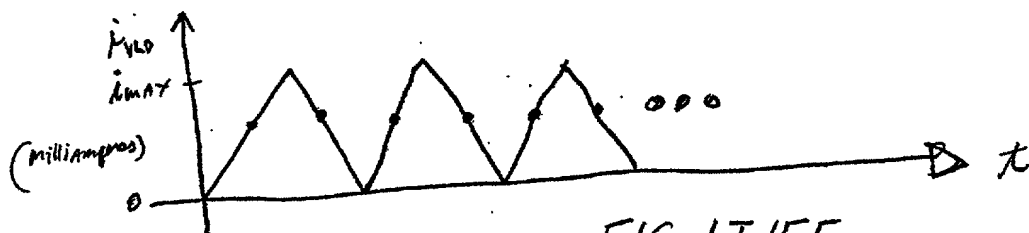


FIG. I I 15 E

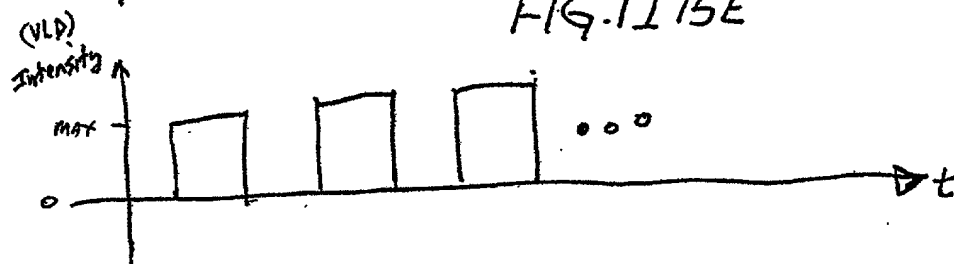


FIG. I I 15 E

Third Generalized Method of  
Reducing Speckle-Noise Patterns  
at Image Detection Array  
of the FFD Subsystem (3)

(TIME)

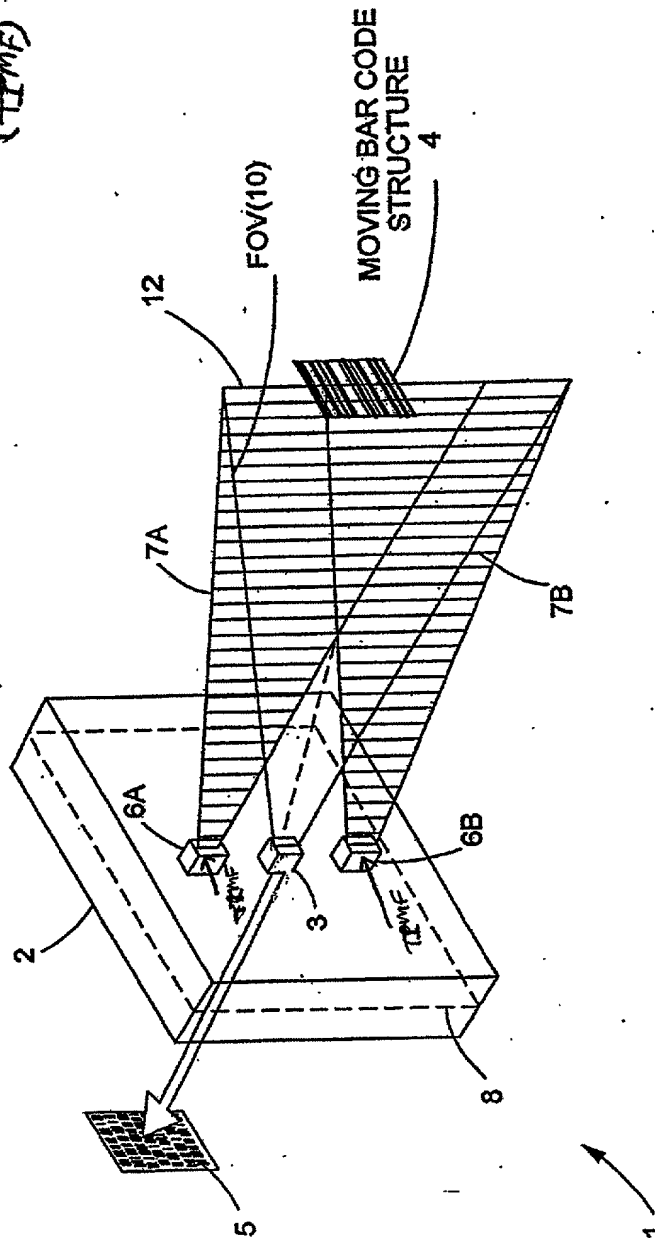


FIG. 1116

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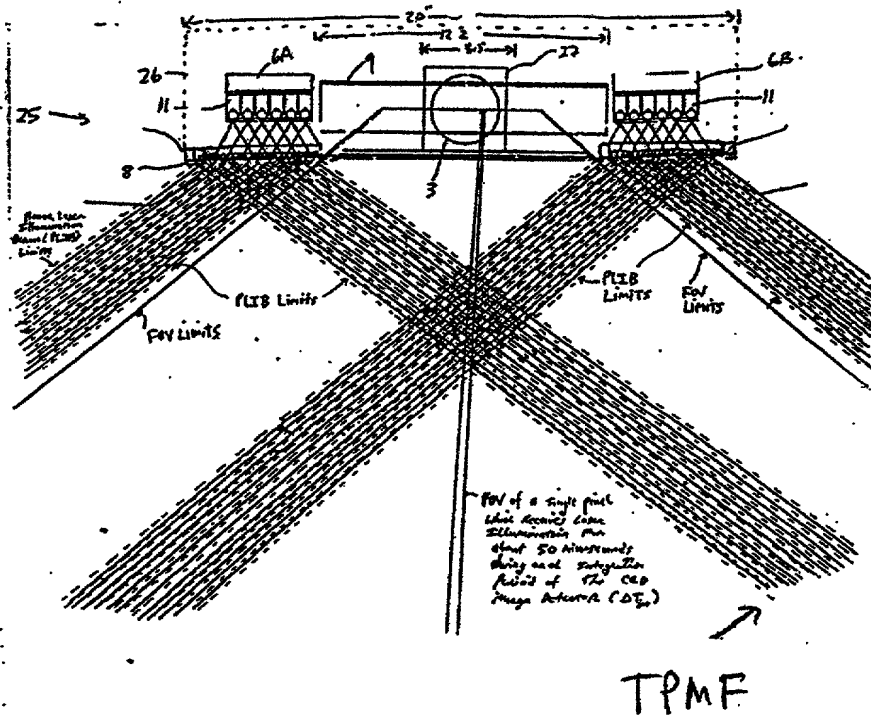


FIG. 1 I 16A

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Third Generalized Speckle-Noise Pattern Reduction Method  
Of The Present Invention

Prior to illumination of the target with the planar laser illumination beam (PLIB), modulate the temporal *phase* of the transmitted PLIB along the ~~planar extent thereof~~ according to a *temporal phase* modulation function (TPMF) so as to:

produce numerous substantially different time-varying speckle-noise patterns at the image detection array of the IFD Subsystem during the photo-integration time period thereof.

↓

Temporally average the numerous substantially different time-varying speckle-noise patterns produced at the image detection array in the IFD Subsystem during the photo-integration time period thereof, so as to thereby reduce power of the speckle-noise pattern observed at the image detection array.

FIG. 1I/6B

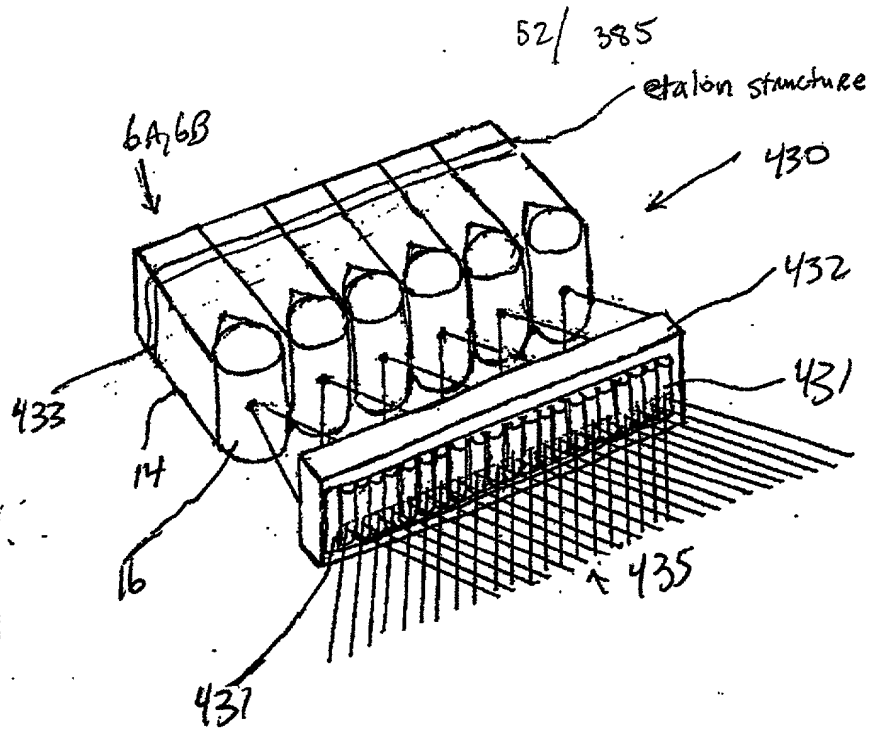


FIG. 1I17A

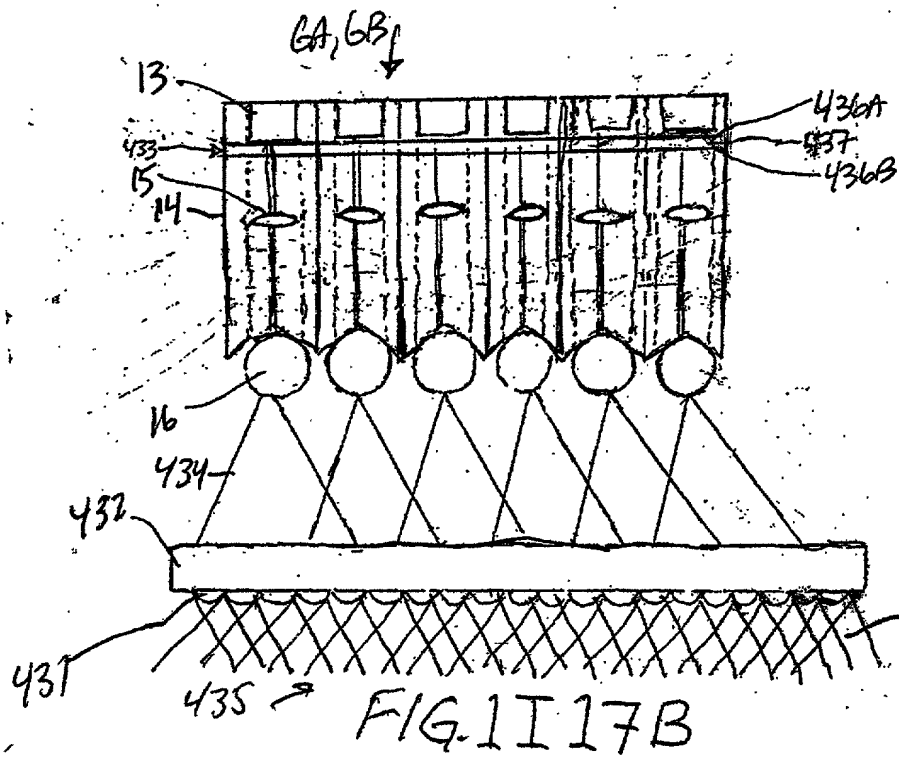


FIG. 1I17B



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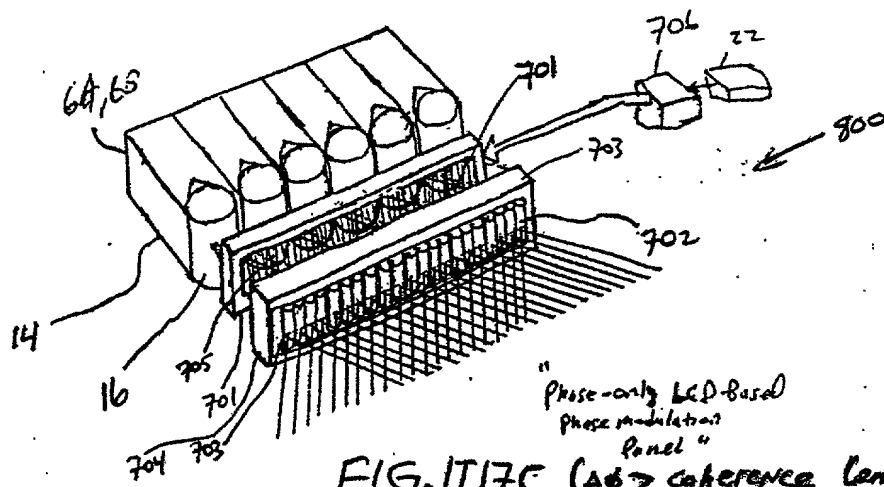


FIG. 1I17C ( $\Delta\phi >$  coherence length) of VLD

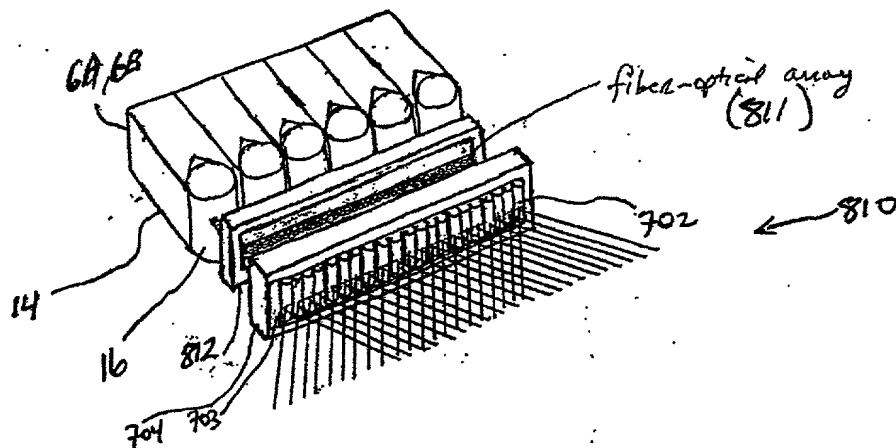


FIG. 1I17D

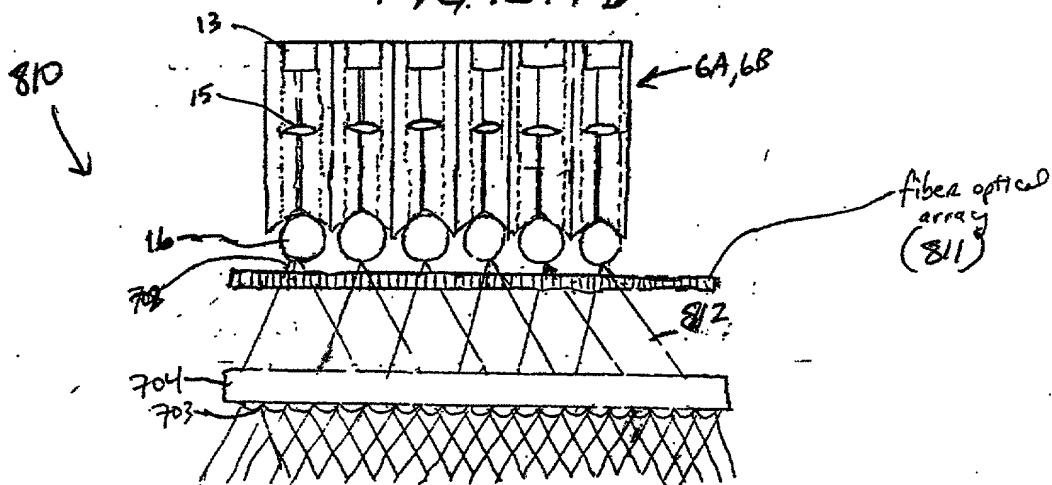


FIG. 1I17E

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Fourth Generalized Method of  
Reducing Speckle-Noise Patterns  
of Image Detection Array  
of the FFO Subsystem (3)

(Temp)

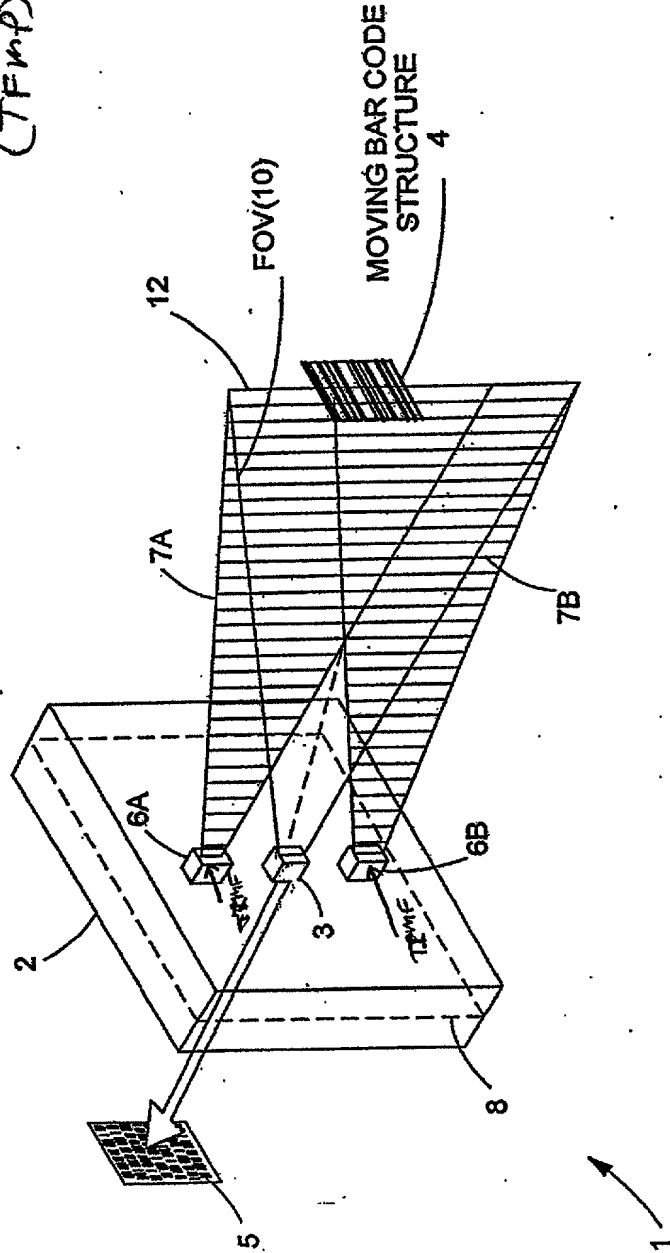


FIG. 1118

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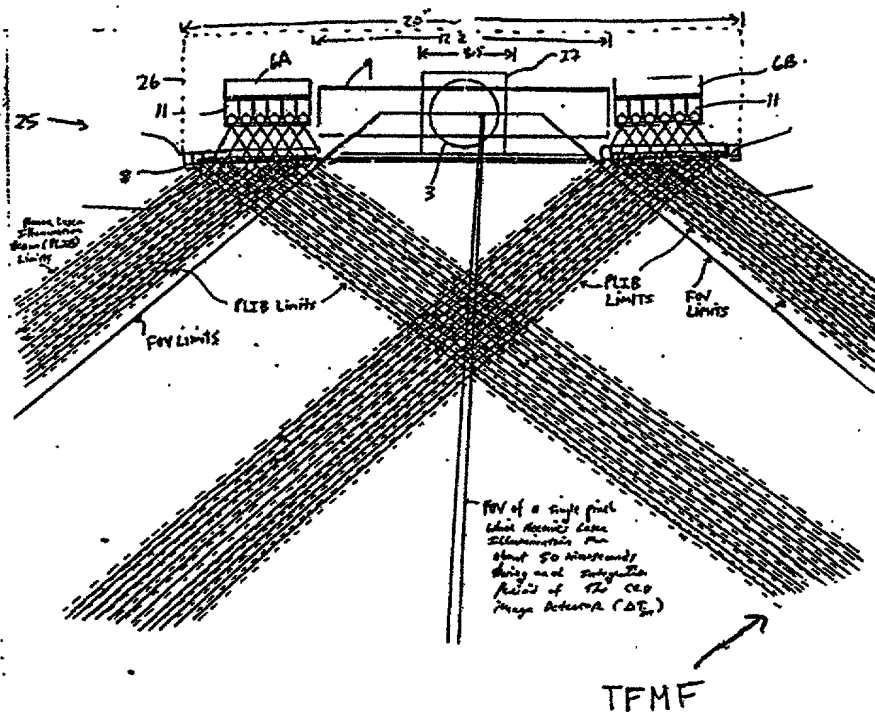


FIG. 1 I 18A

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Fourth Generalized Speckle-Noise Pattern Reduction Method  
Of The Present Invention

Prior to illumination of the target with the planar laser illumination beam (PLIB), modulate the temporal frequency of the transmitted PLIB according to a temporal intensity modulation function (TIMF) so as to

produce numerous substantially different time-varying speckle-noise patterns at the image detection array of the IFD Subsystem during the photo-integration time period thereof.

Temporally average the numerous substantially different time-varying speckle-noise patterns produced at the image detection array in the IFD Subsystem during the photo-integration time period thereof, so as to thereby reduce power of the speckle-noise pattern observed at the image detection array.

FIG. 1I18B

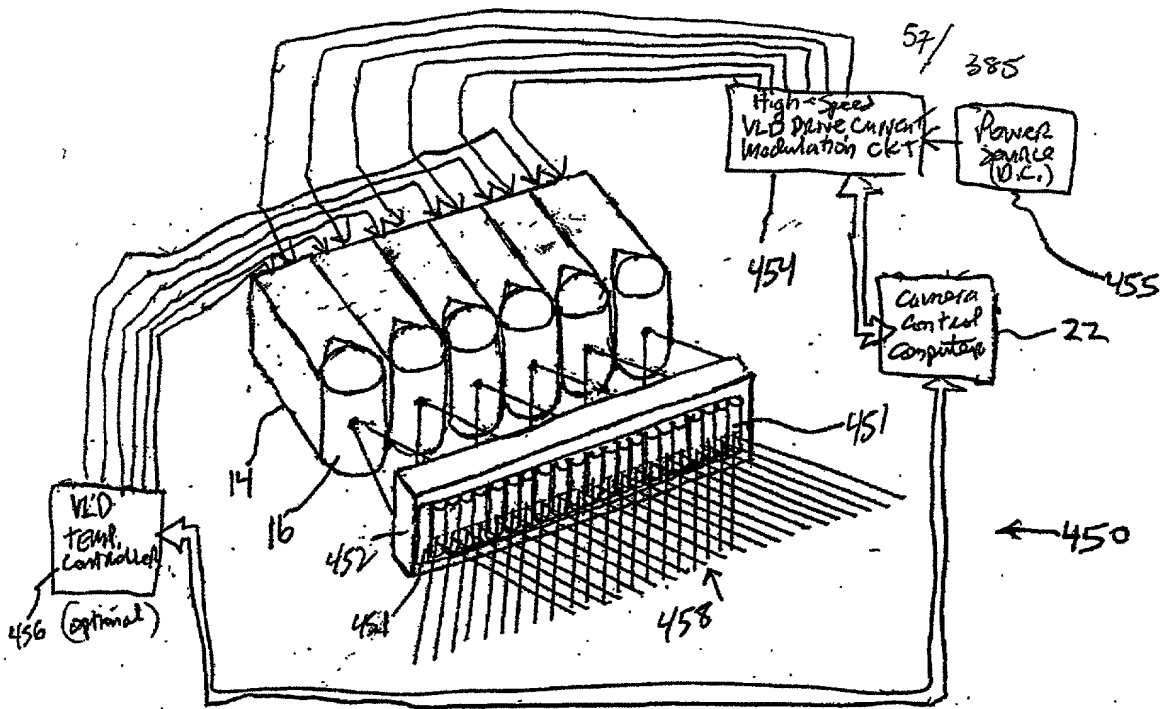
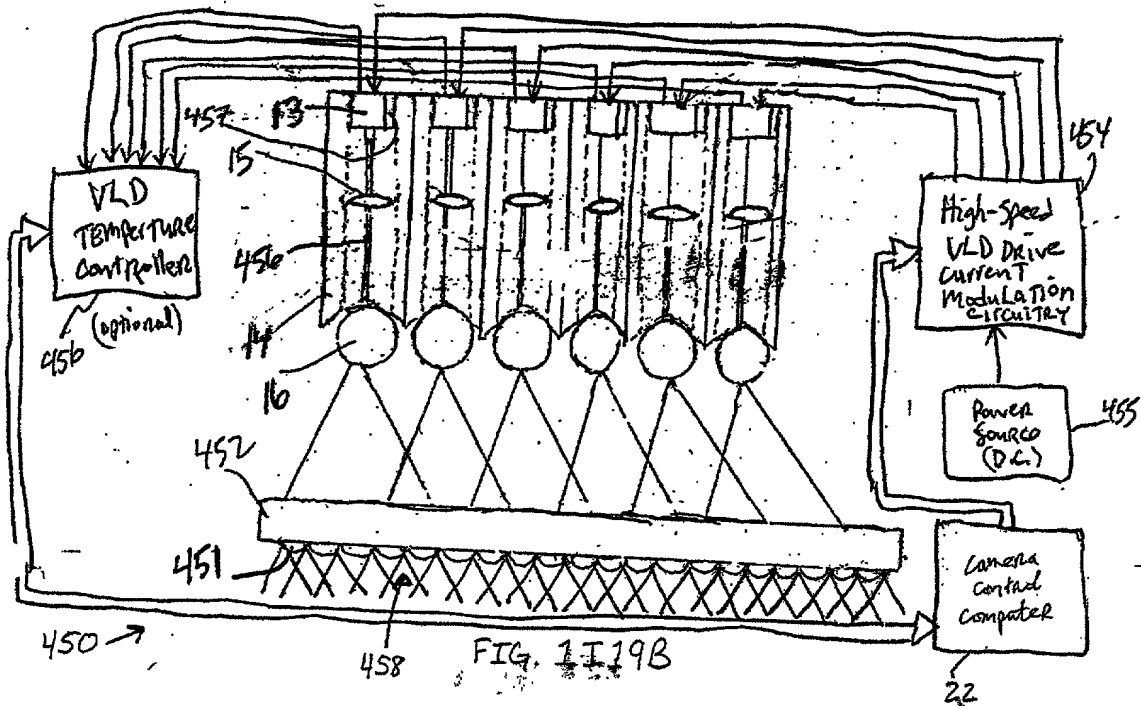


FIG. 1I 19A



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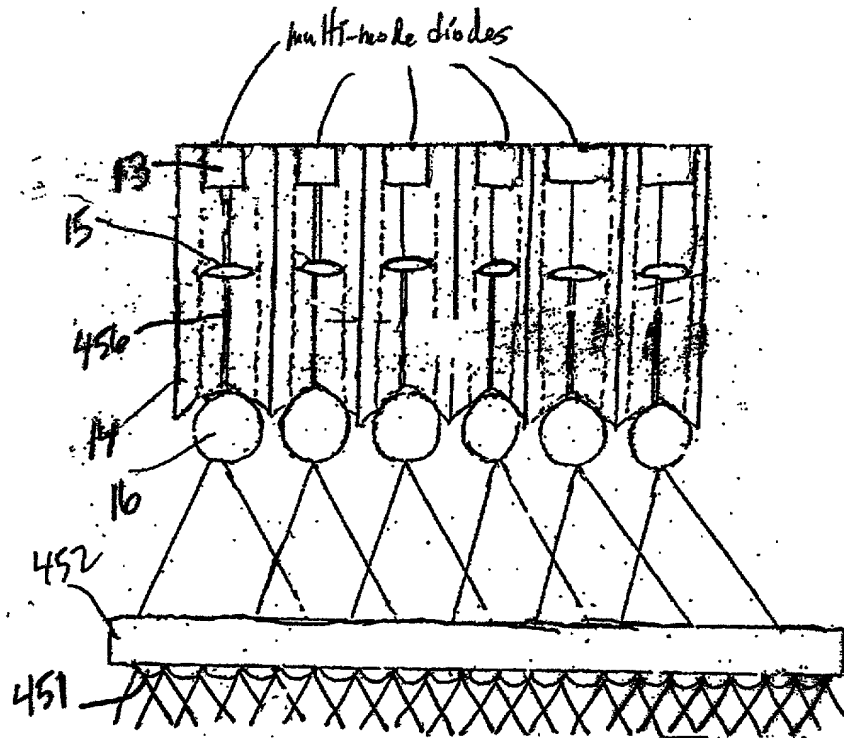


FIG 1I19C

FIG. 19 GENERALIZED METHOD  
of Reducing Speckle Noise  
Patterns AT Image  
Detection array OF the  
SPD subsystem (3)

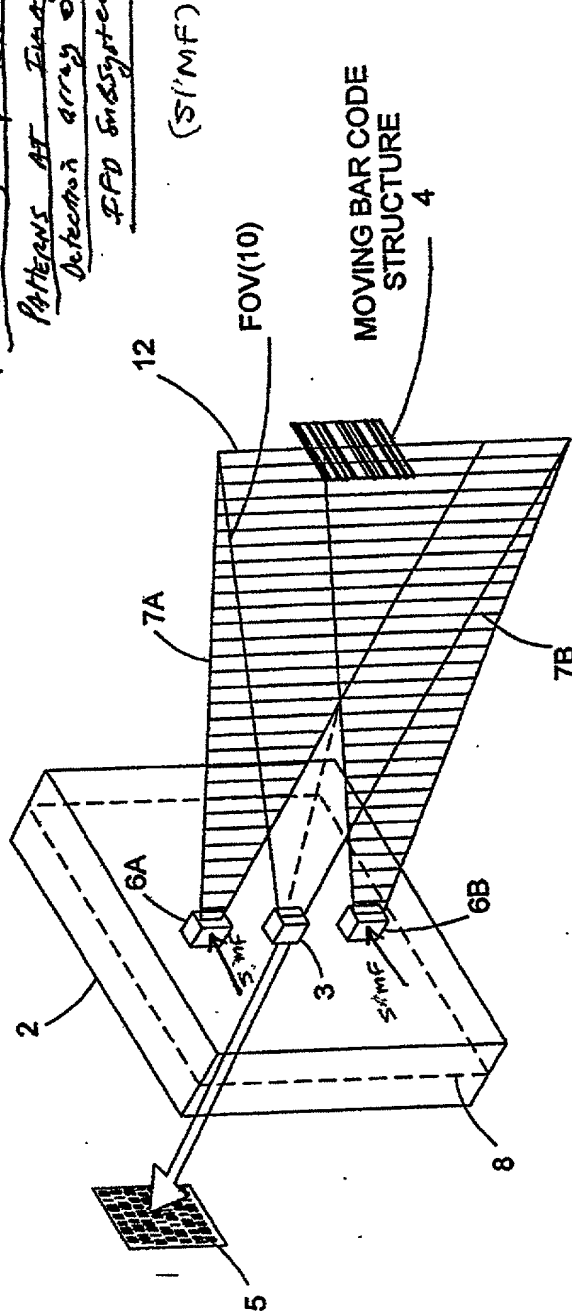
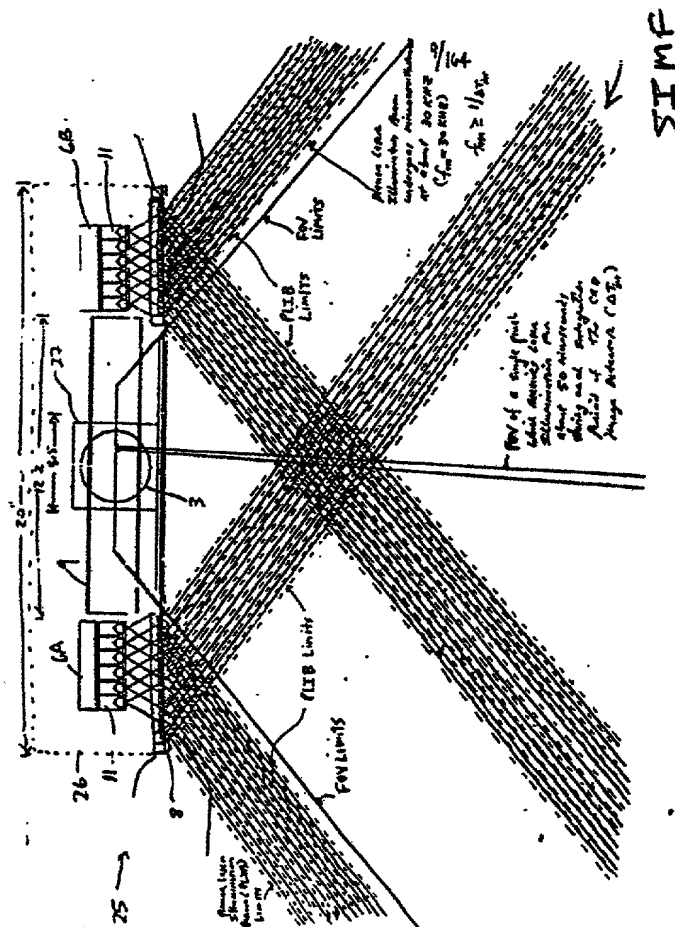


FIG. 20

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Prior to object illumination

FIG. 1 I 20A



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Fifth Generalized Speckle-Noise Pattern Reduction Method  
Of The Present Invention

Prior to illumination of the target with the planar laser illumination beam (PLIB), modulate the spatial intensity of the transmitted PLIB along the planar extent thereof according to a spatial intensity modulation function (SIMF) so as to :

produce numerous substantially different time-varying speckle-noise patterns at the image detection array of the IFD Subsystem during the photo-integration time period thereof.



Temporally average the numerous substantially different time-varying speckle-noise patterns produced at the image detection array in the IFD Subsystem during the photo-integration time period thereof, so as to thereby reduce power of the speckle-noise pattern observed at the image detection array.

FIG. 1I20B

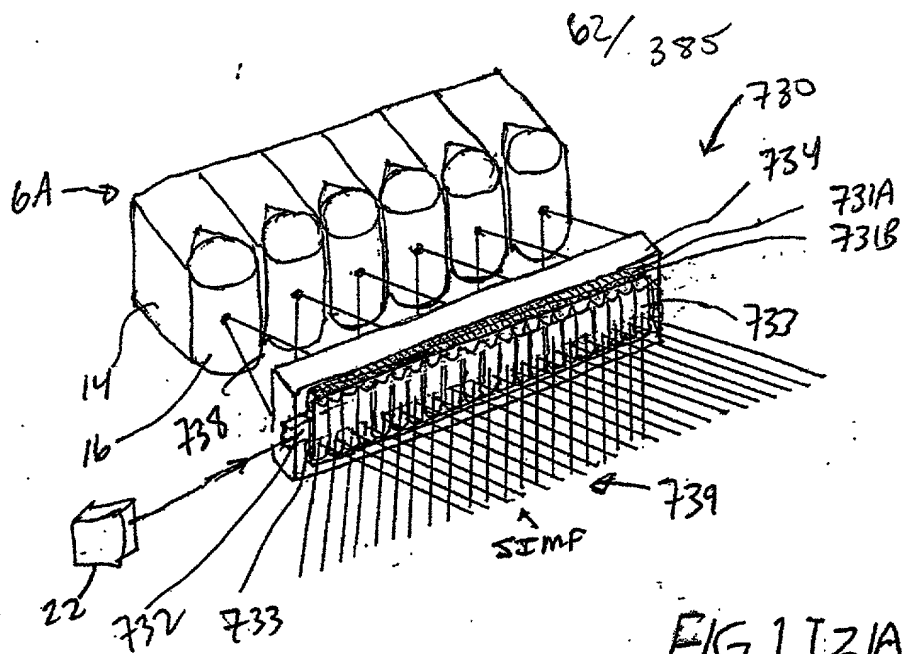


FIG. 1I2IA

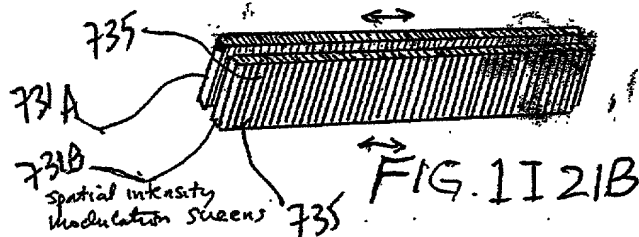
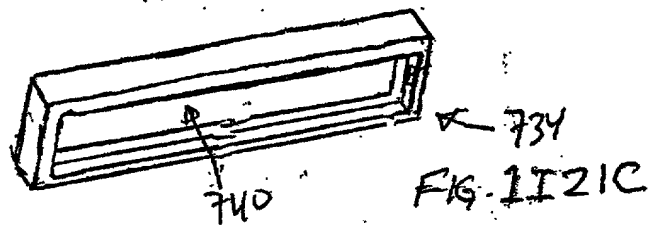


FIG. 1I2IB



Generalized Method of  
Reducing Speckle-Noise Patterns  
at Image Detection array  
of the IFD Subsystem

(SIMF)

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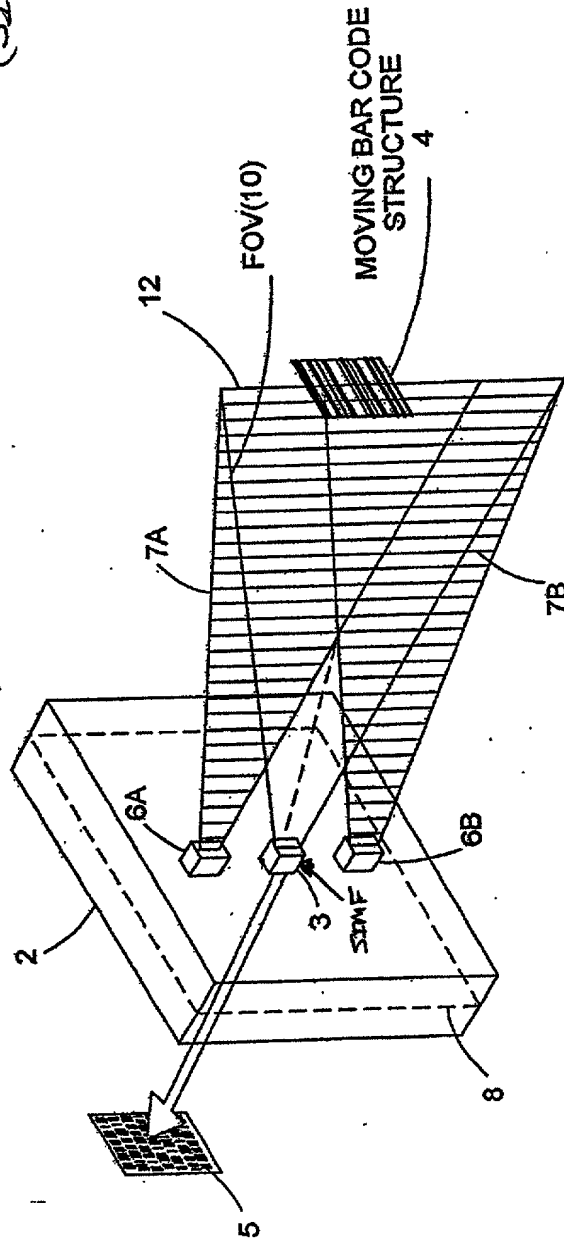


FIG. 1I 22

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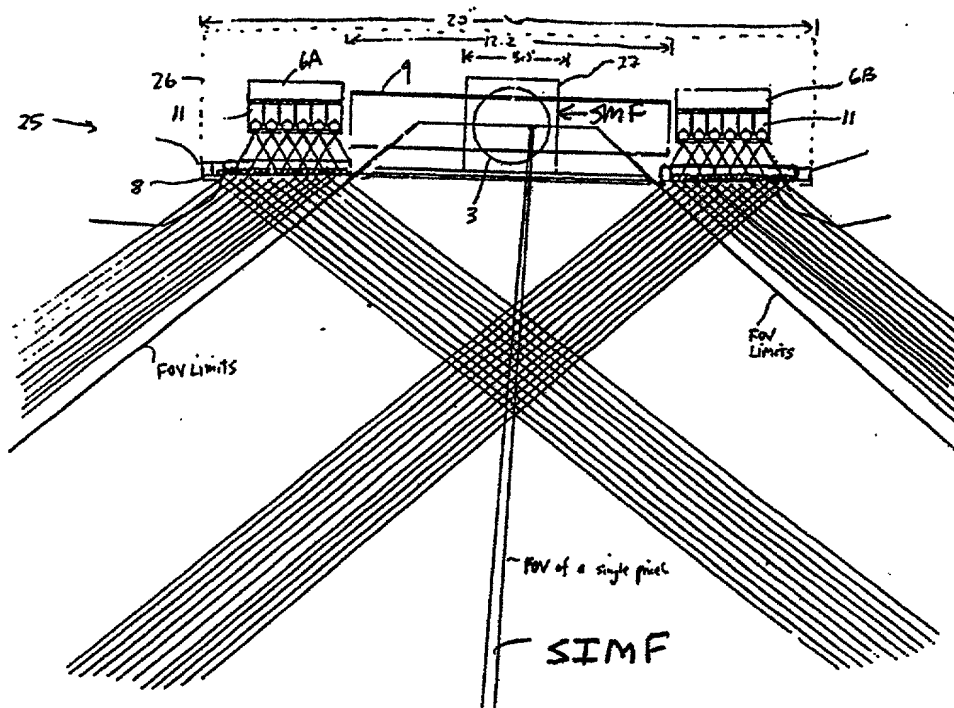


FIG. 1122A

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Sixth Generalized Speckle-Noise Pattern Reduction Method  
Of The Present Invention

After illumination of the target with the planar laser illumination beam (PLIB), modulate the spatial intensity of the reflected/scattered (i.e. received) PLIB along the planar extent thereof according to a spatial intensity modulation function (SIMF) so as to :

produce numerous substantially different time-varying speckle-noise patterns at the image detection array of the IFD Subsystem during the photo-integration time period thereof.

Temporally average the many substantially different time-varying speckle-noise patterns produced at the image detection array in the IFD Subsystem during the photo-integration time period thereof, so as to thereby reduce the speckle-noise pattern observed at the image detection array.

FIG. 1I 22B

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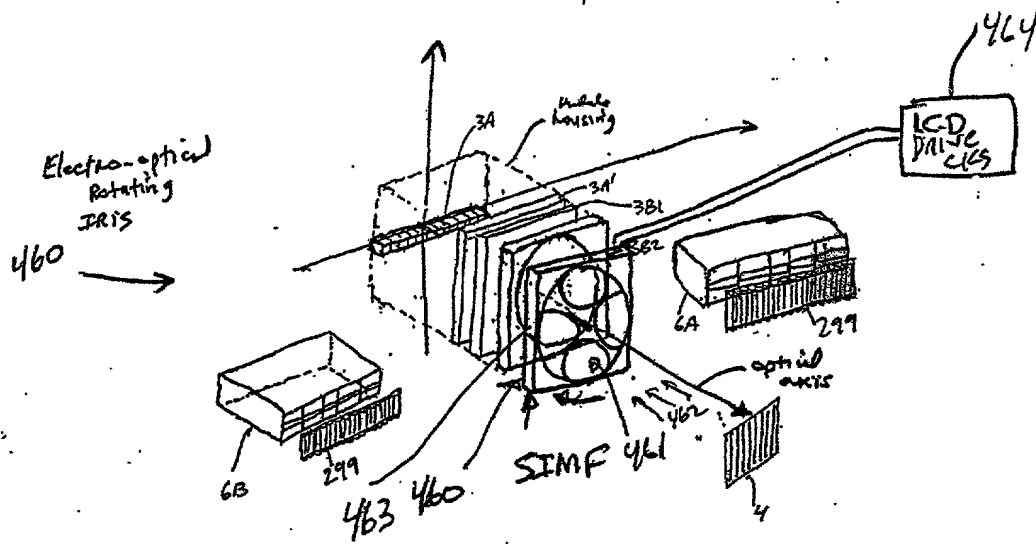


FIG. 1I 23A

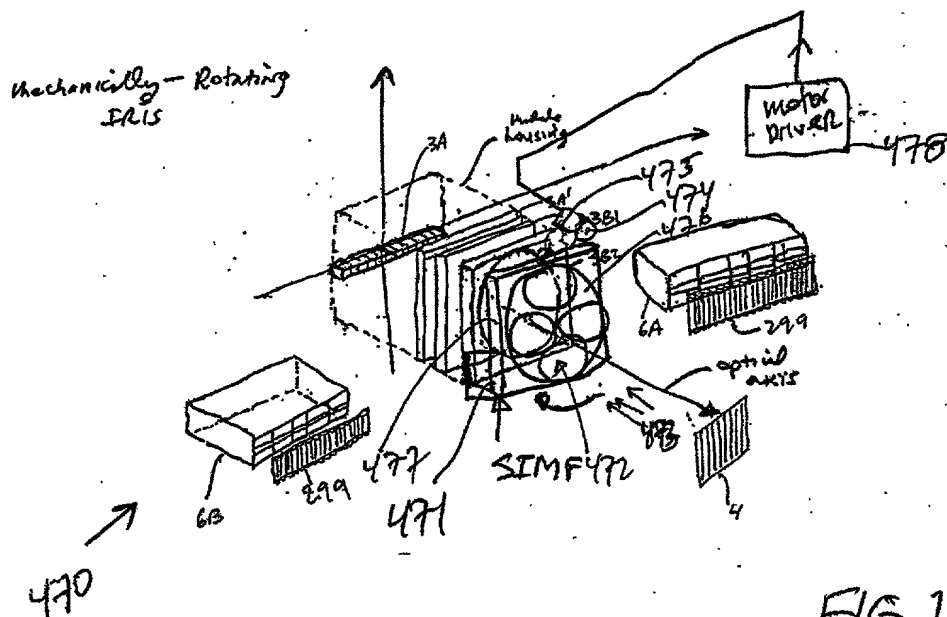


FIG. 1I 23B

Seventh Generalized Method of  
Reducing Spindle-Noise Patterns  
at Image Detection Array  
of 2D IFD Subsystem

(TIME)

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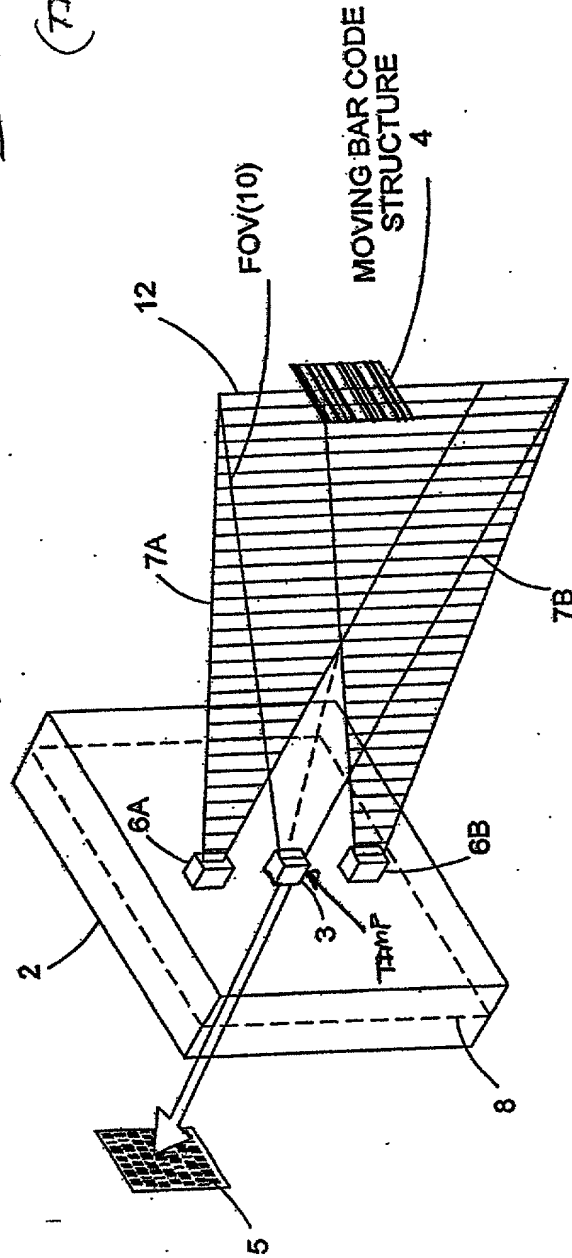


FIG. 1124

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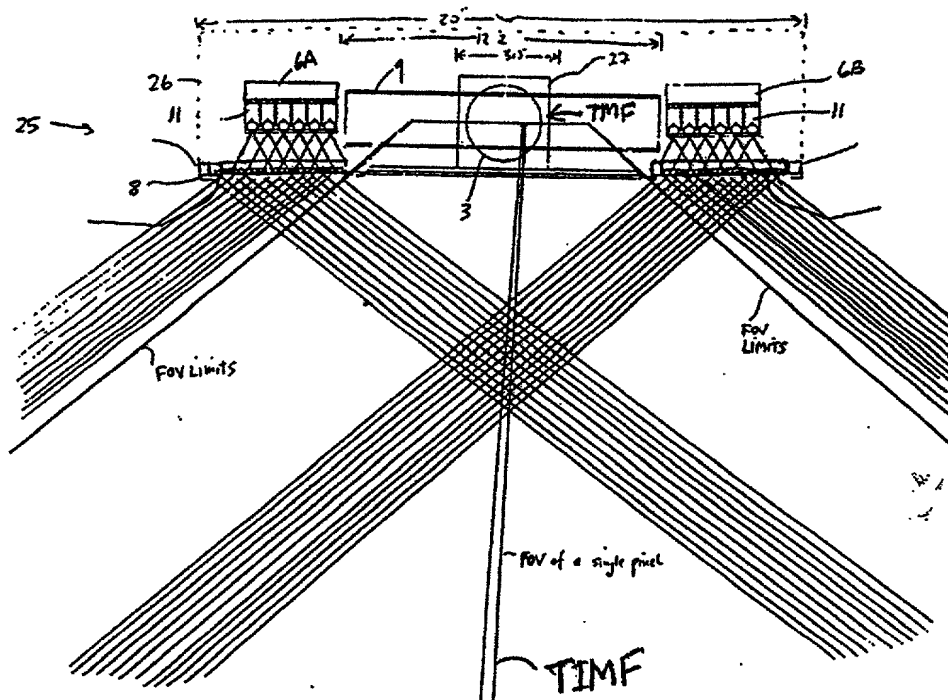


FIG. 1I24A



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Seventh Generalized Speckle-Noise Pattern Reduction Method  
Of The Present Invention

After illumination of the target with the planar laser illumination beam (PLIB), modulate the temporal intensity of the reflected/scattered (i.e. received) PLIB along the planar extent thereof according to a temporal intensity modulation function (TIMF) so as to :

produce many substantially different time-varying speckle-noise patterns at the image detection array of the IFD Subsystem during the photo-integration time period thereof.

Temporally average the many substantially different time-varying speckle-noise patterns produced at the image detection array in the IFD Subsystem during the photo-integration time period thereof, so as to thereby reduce the speckle-noise pattern observed at the image detection array.

FIG. 1I 24B

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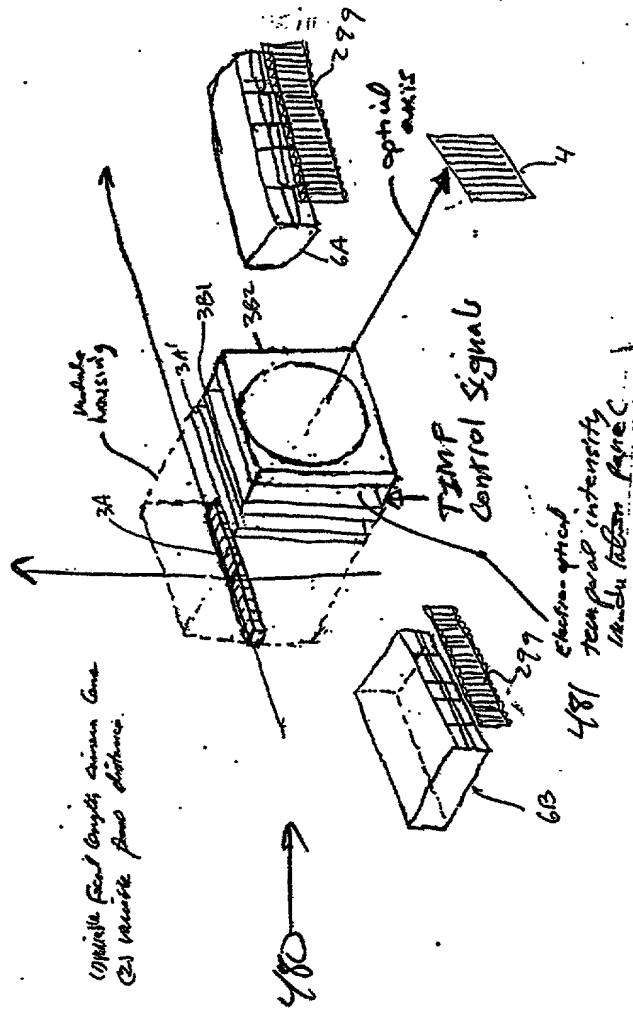


FIG. 11Z4C

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EIGHT GENERALIZED METHOD OF REDUCING THE SPECKLE PATTERN  
NOISE OBSERVED IN PLIIM-BASED IMAGING SYSTEMS

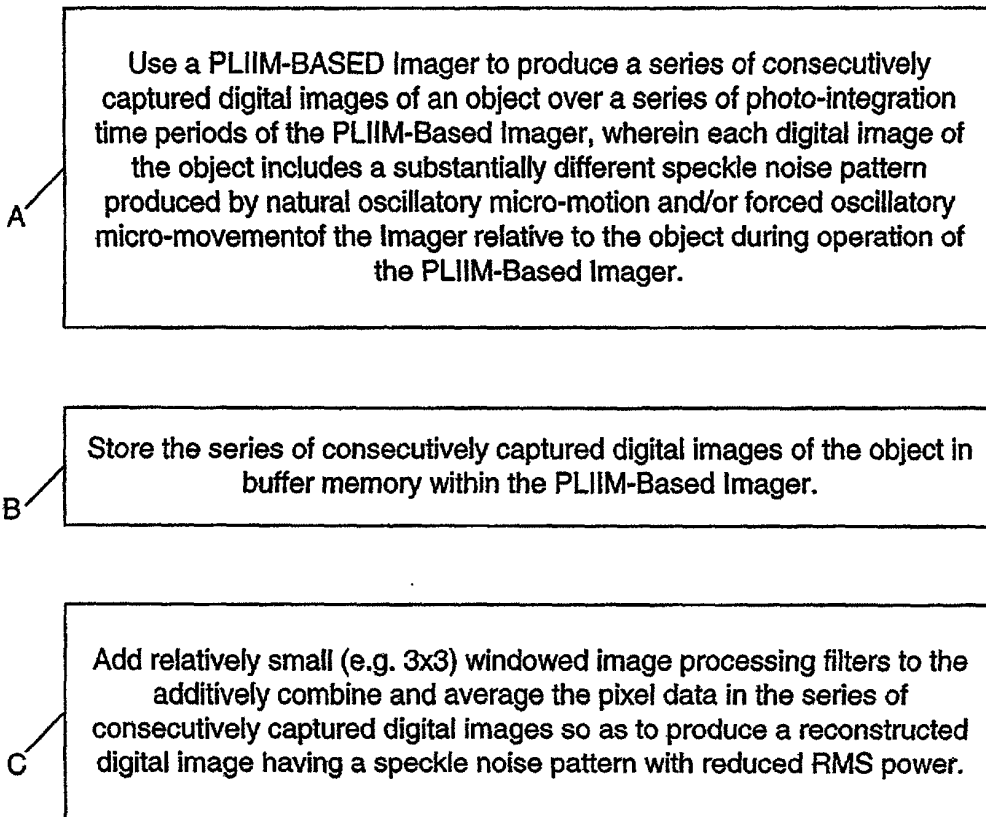
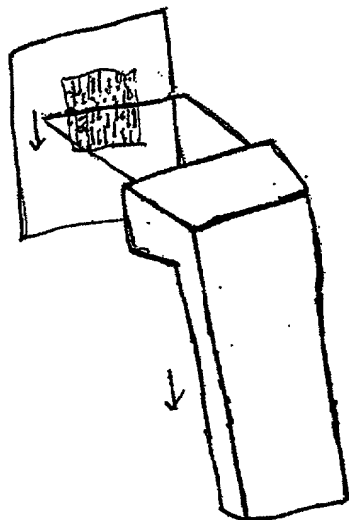


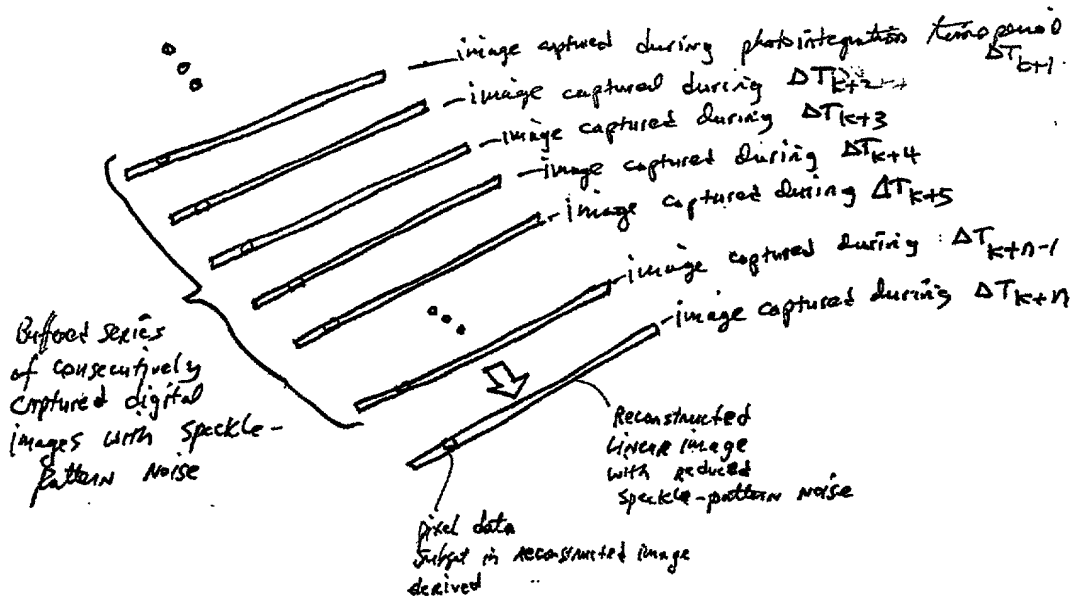
FIG. 1124D

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Manual  
Sweeping  
Action  
across Code Symbol  
or  
graphical indicia

FIG. 1124E



Case: Linear Image

FIG. 1124F

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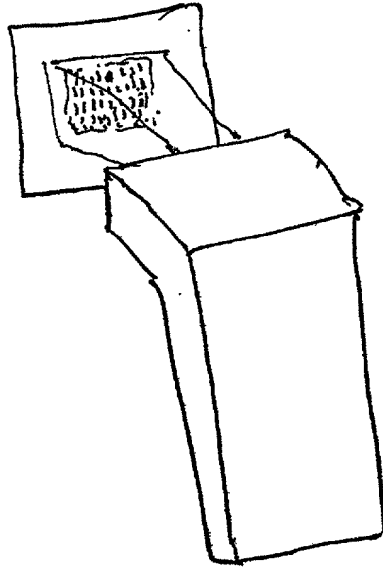


FIG. 1I24G

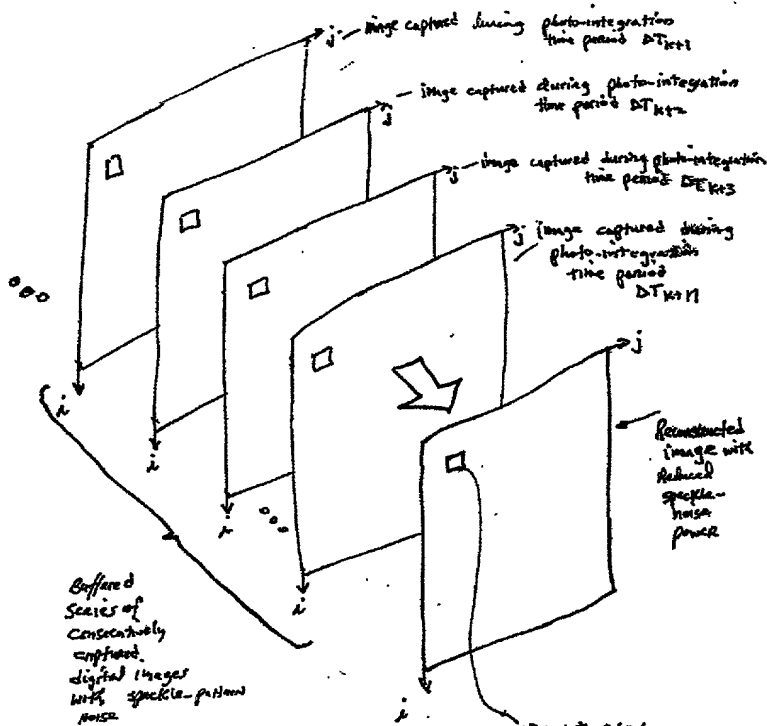


FIG 1I24H

Case: 2D Area Imager

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NINTH GENERALIZED METHOD OF REDUCING SPECKLE PATTERN  
NOISE IN PLIIM-BASED IMAGING SYSTEMS

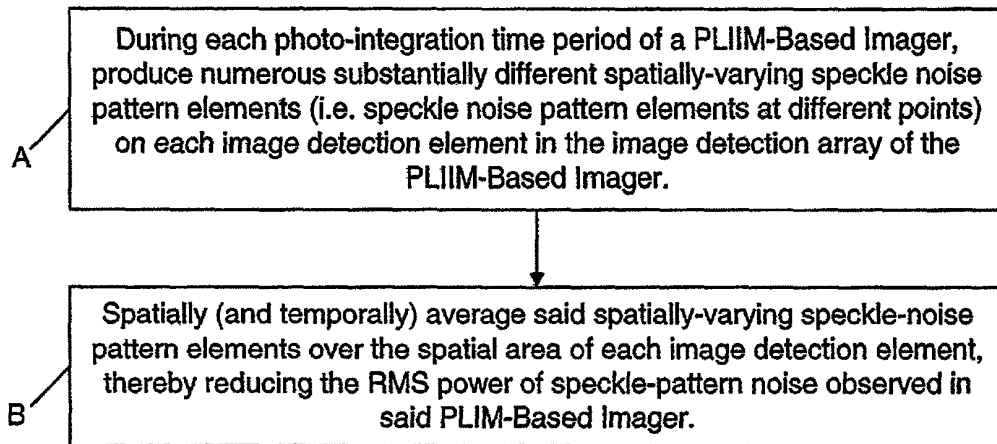
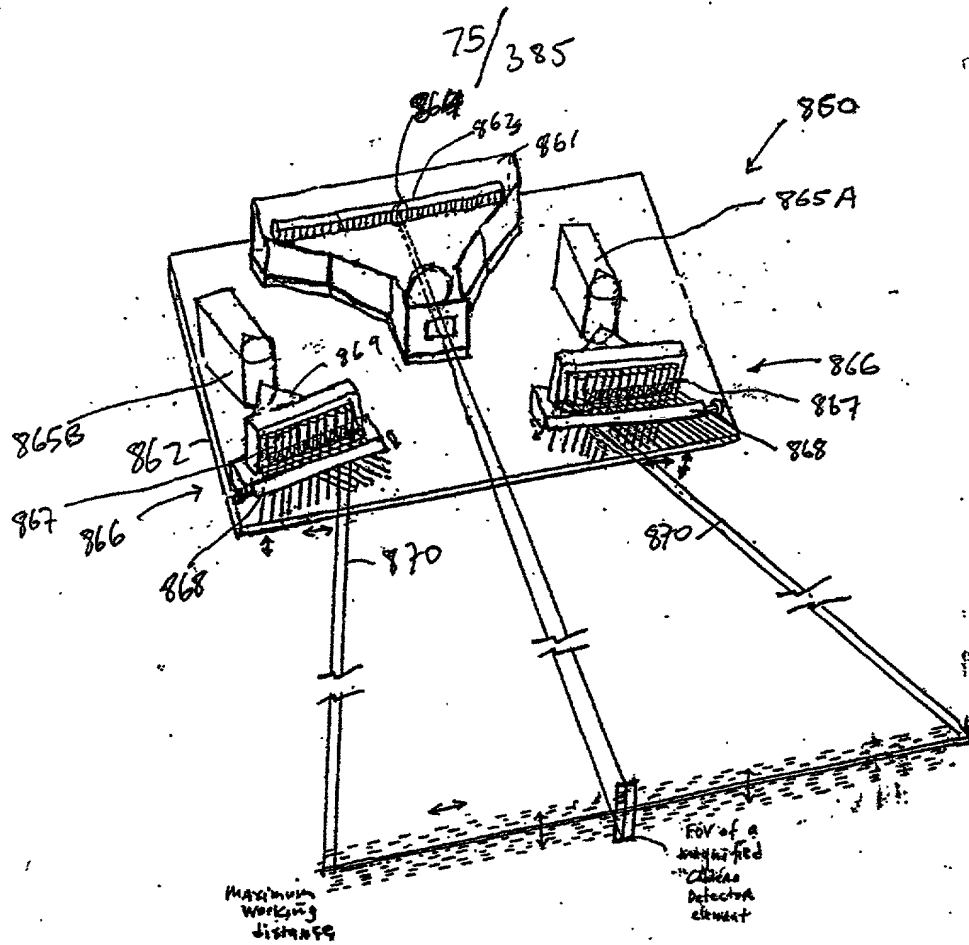


FIG. 1124I



\* Lateral and Transverse Microoscillation of PLIB

FIG. 1I25A1

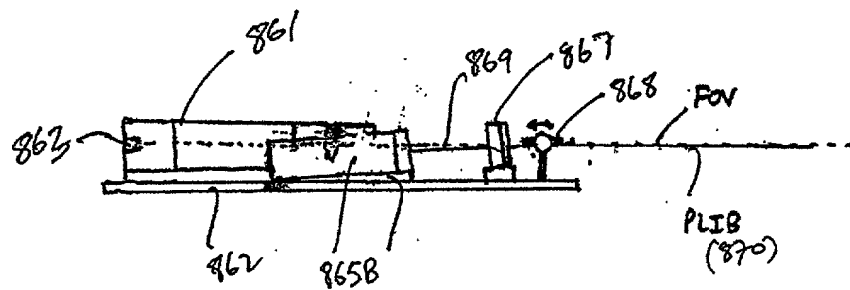
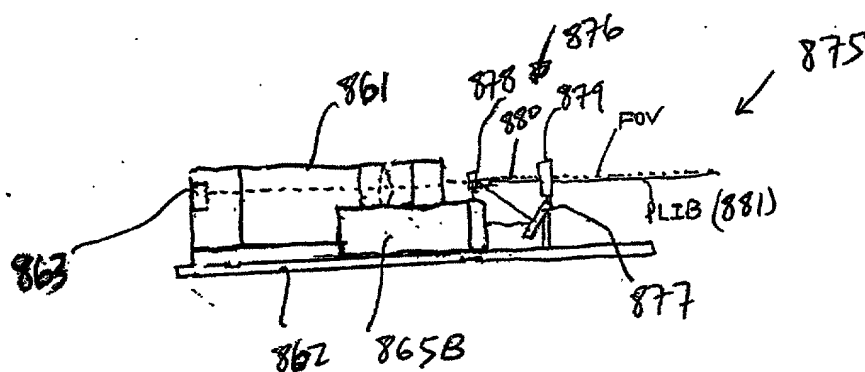
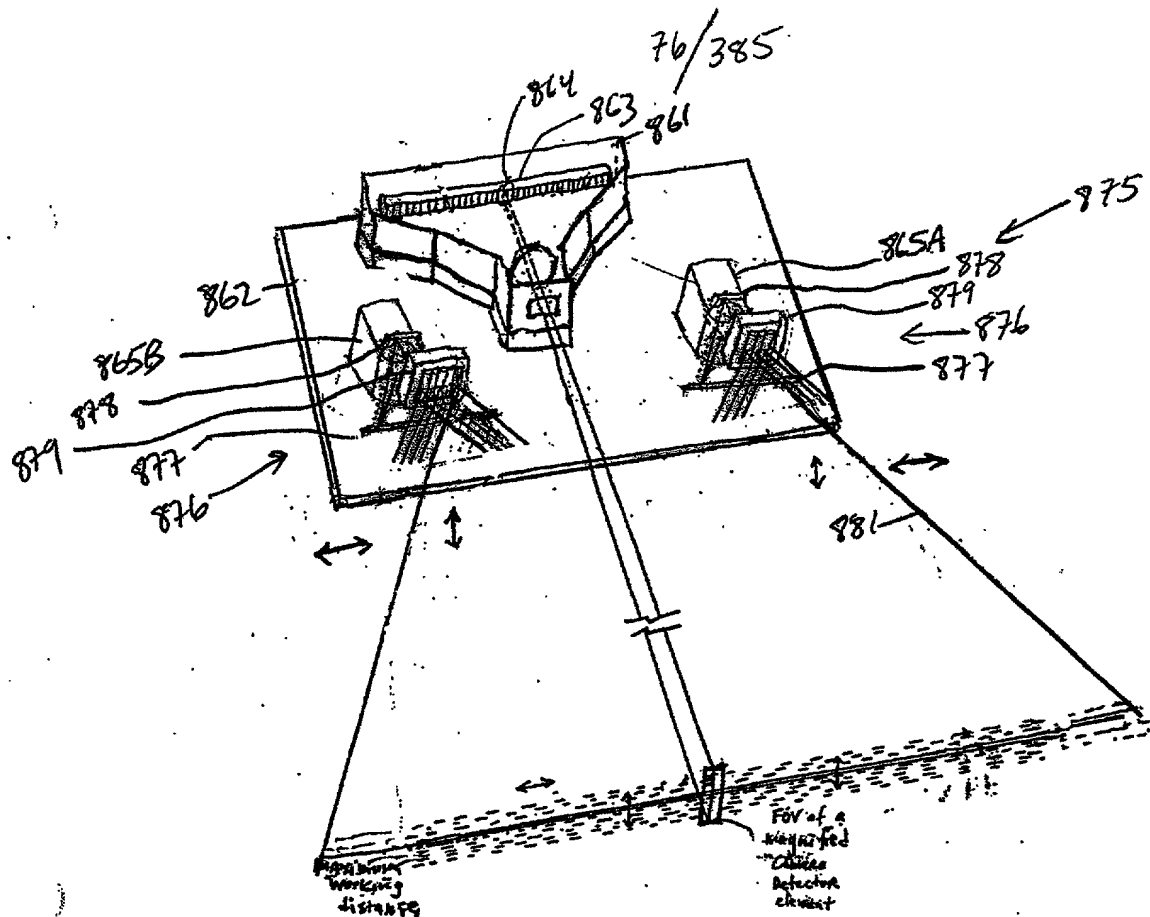
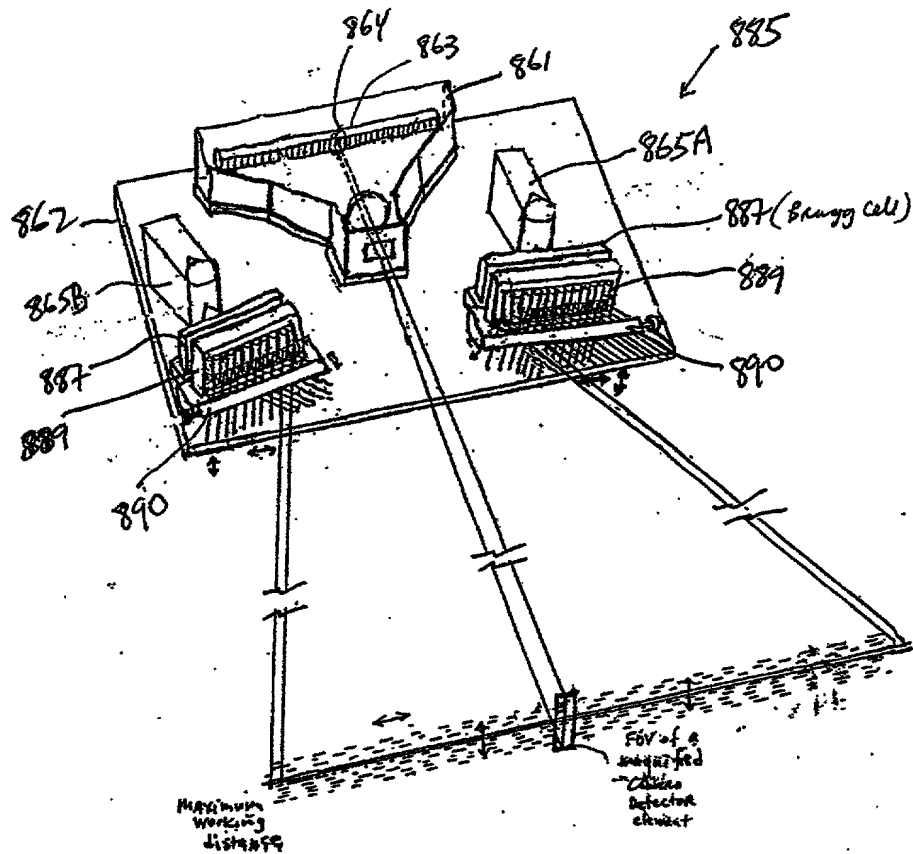


FIG. 1I25A2





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\* Internal and Transverse Microoscillation of PLIB

FIG. 1I25C1

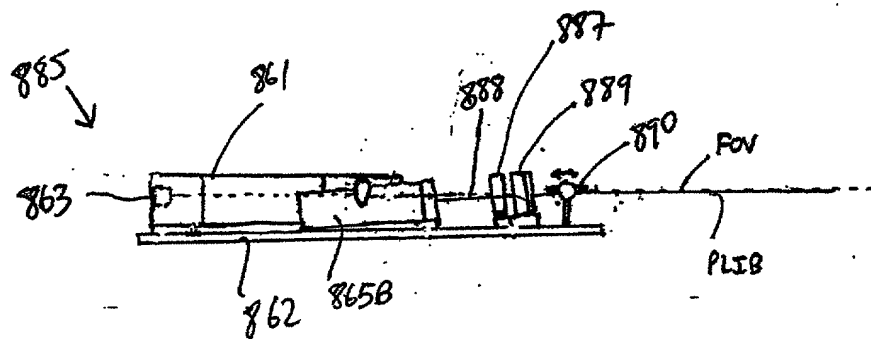
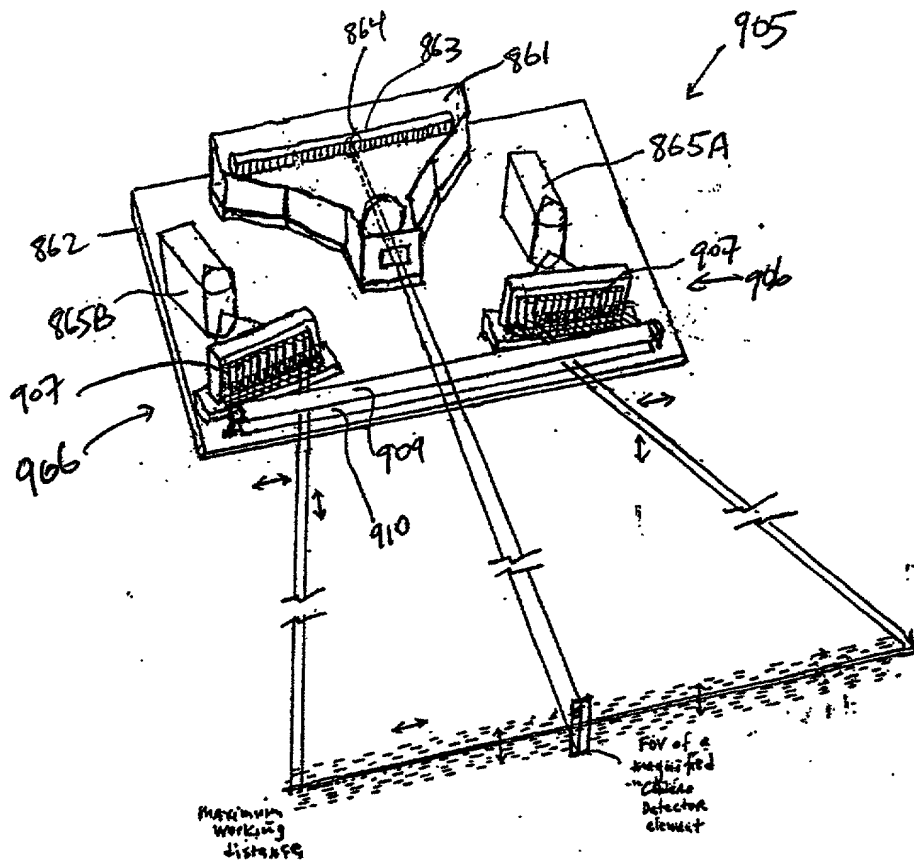


FIG. 1I25C2



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\* Lateral and Transverse Microoscillation of PLIB

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FIG. 1I25E1

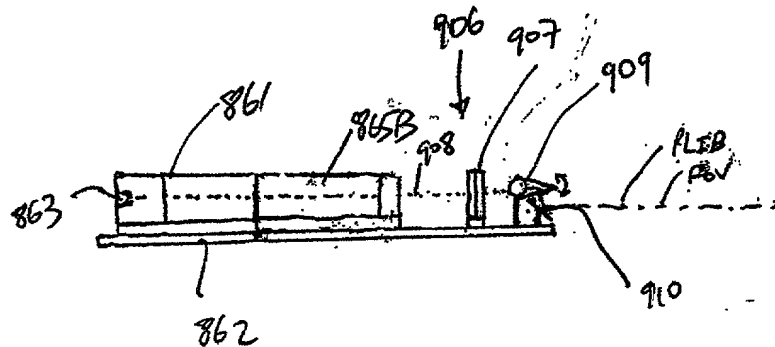
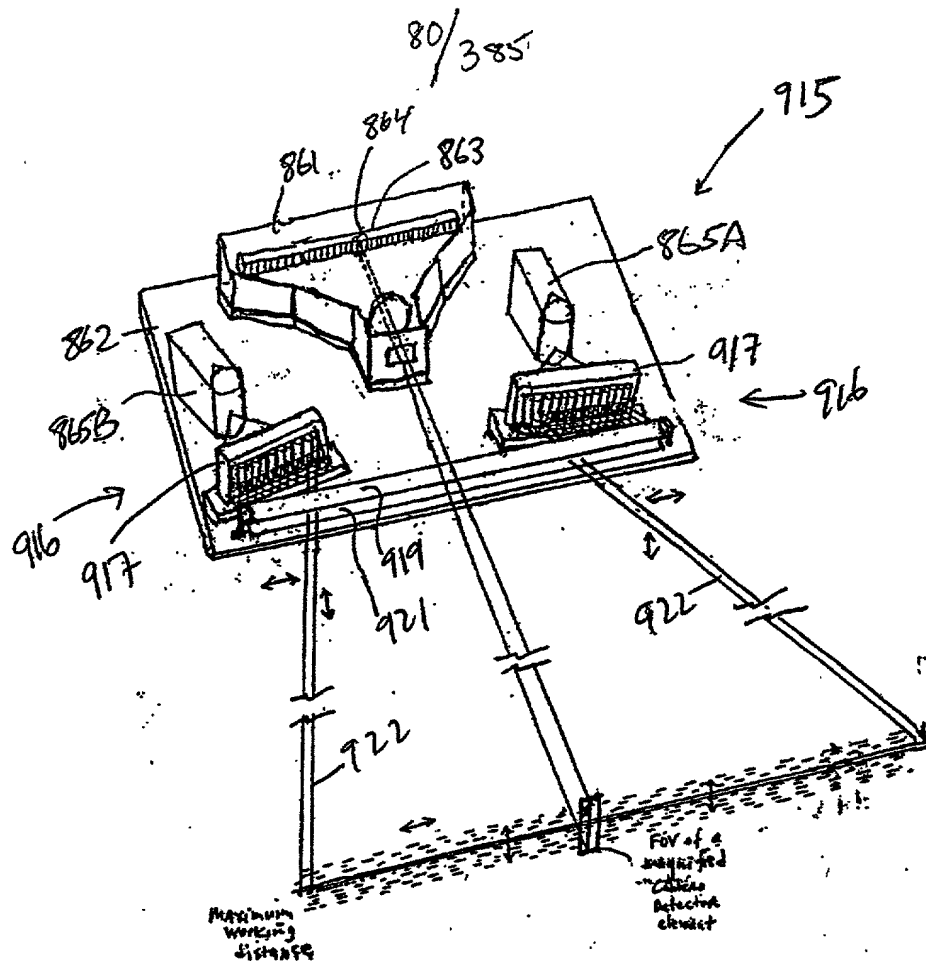


FIG. 1I25E2



\* Lateral and Transverse Microsculptation of PLIB

FIG. 1I25F1

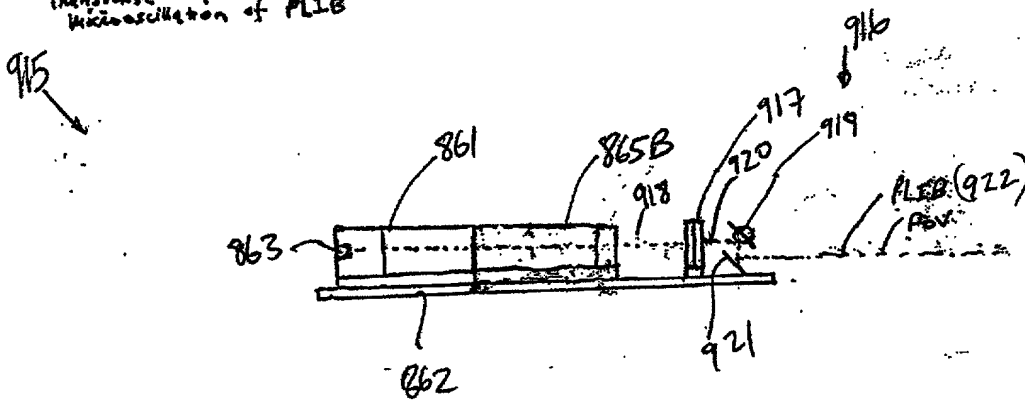
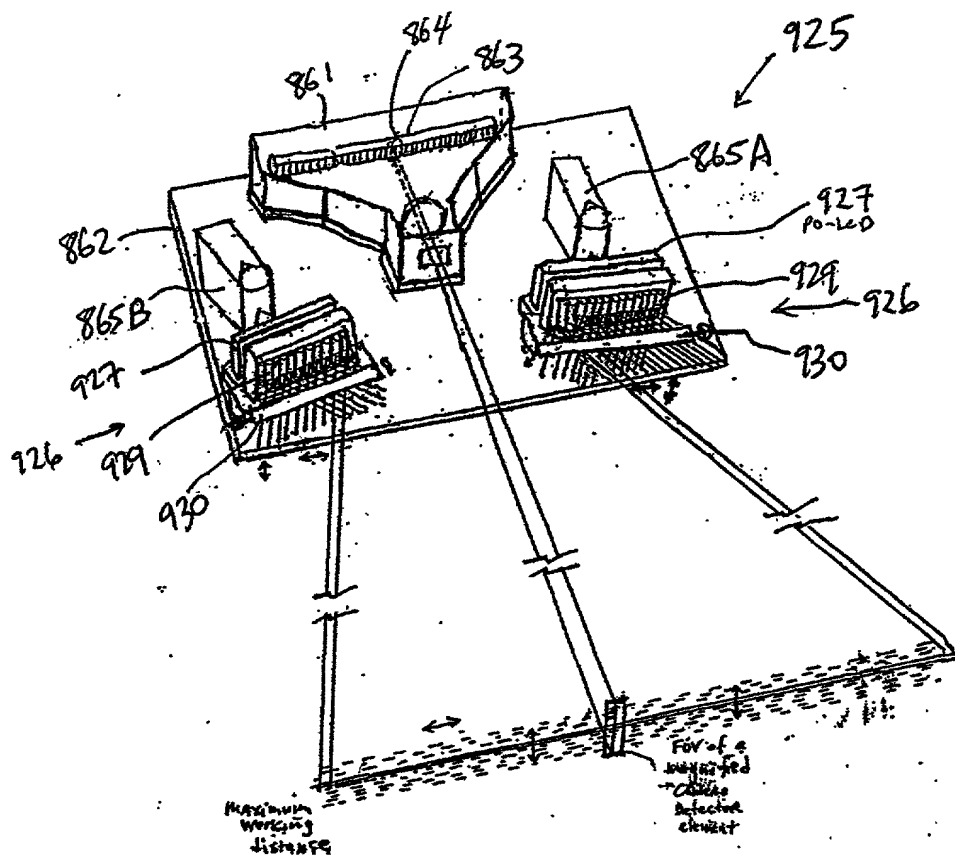


FIG. 1I25F2

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\* Lateral and Transverse Misalignment of PLIB

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FIG. 1I25G1

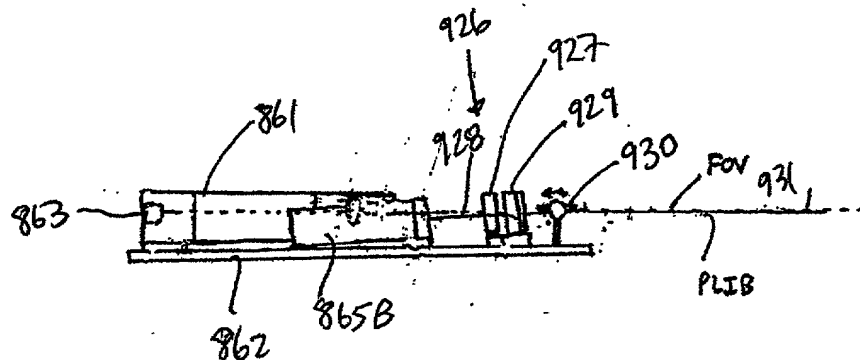
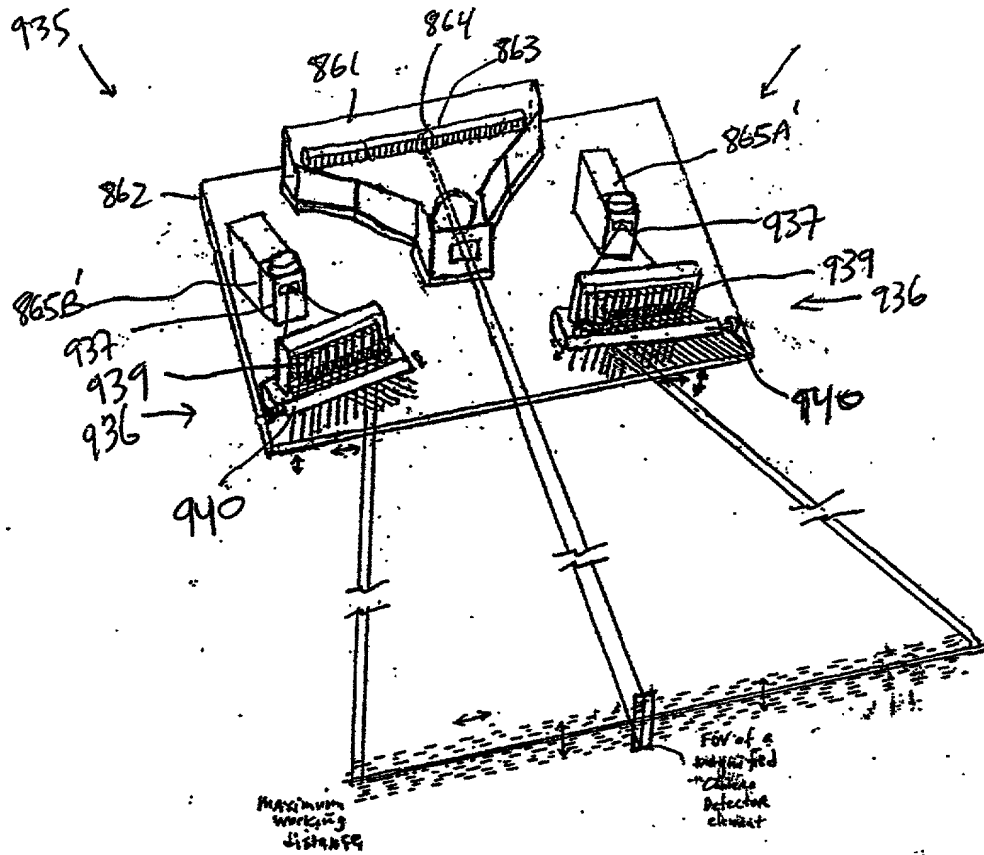


FIG. 1I25G2

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\* Lateral and Transverse Misalignment of PLIB

FIG. 1I25H1

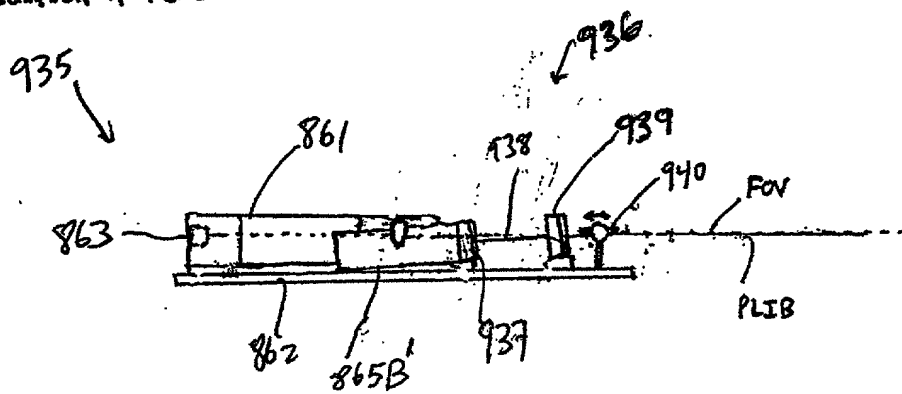


FIG. 1I25H2



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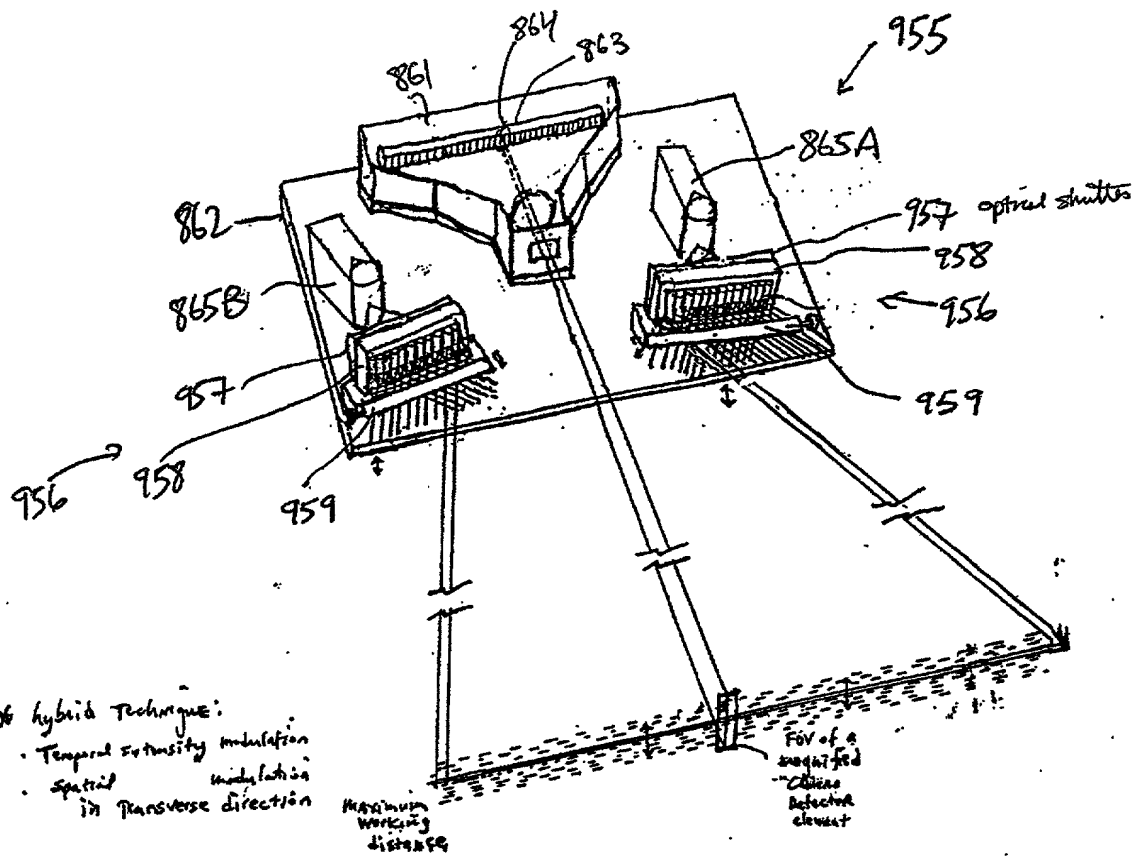


FIG. 1I25J1

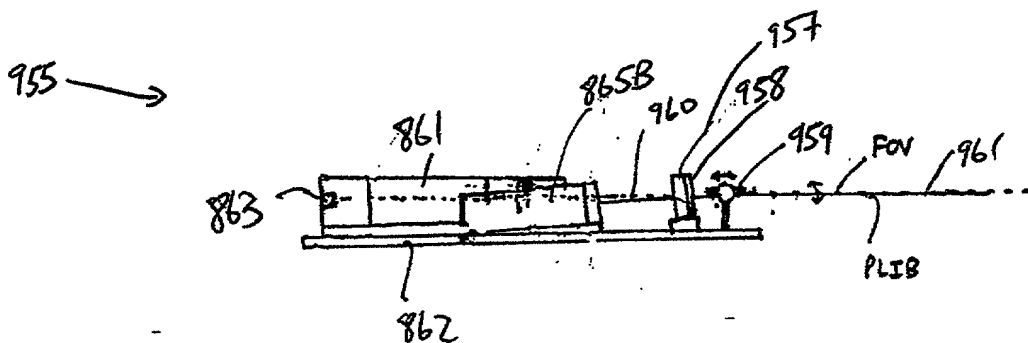


FIG. 1I25J2



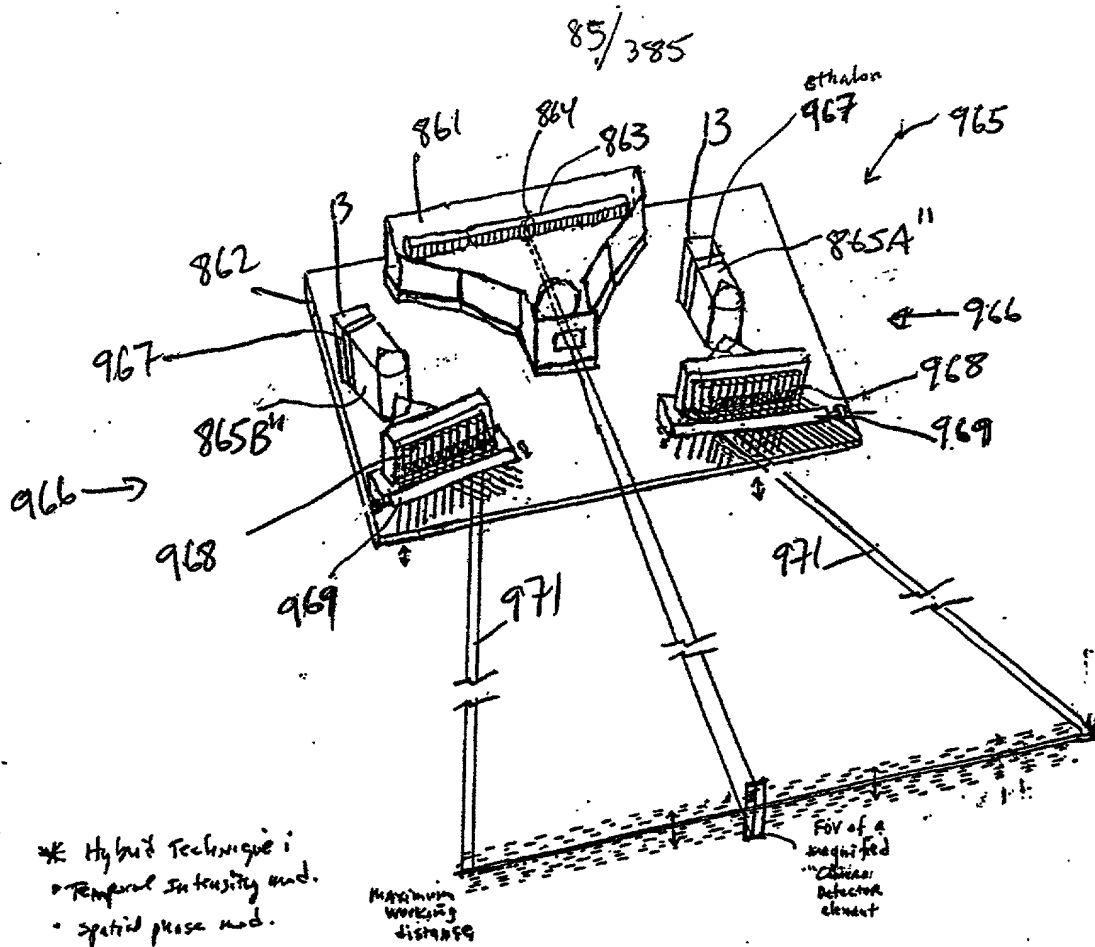


FIG. 1I25K1

\* Transverse  
 Modulation of PLIB

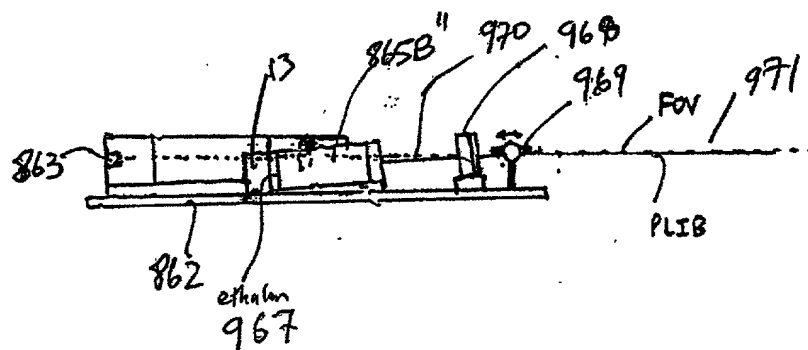
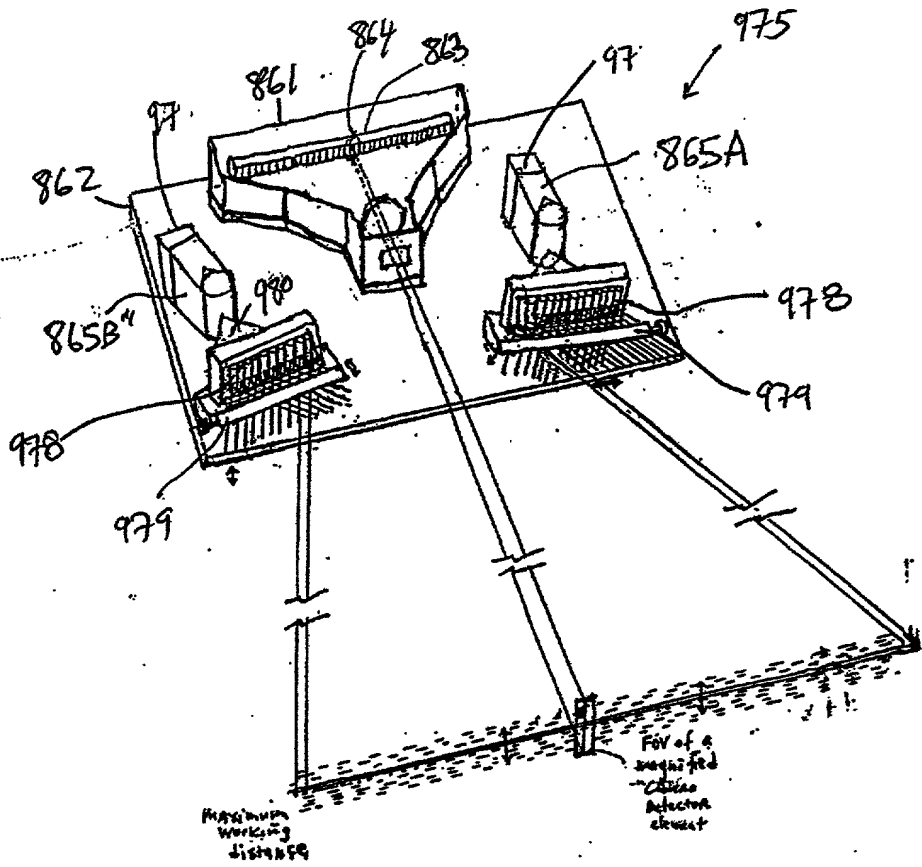


FIG. 1I25K2

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\* hybrid =  
• Temp. freq. mod.  
• Spatial phase mod.

\* Transverse  
Microoscillation of PLIB

FIG. 1I25L1

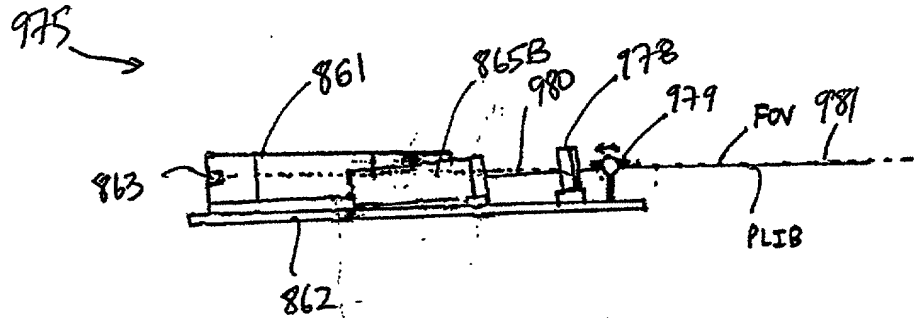


FIG. 1I25L2

2022-06-06 14:00:00

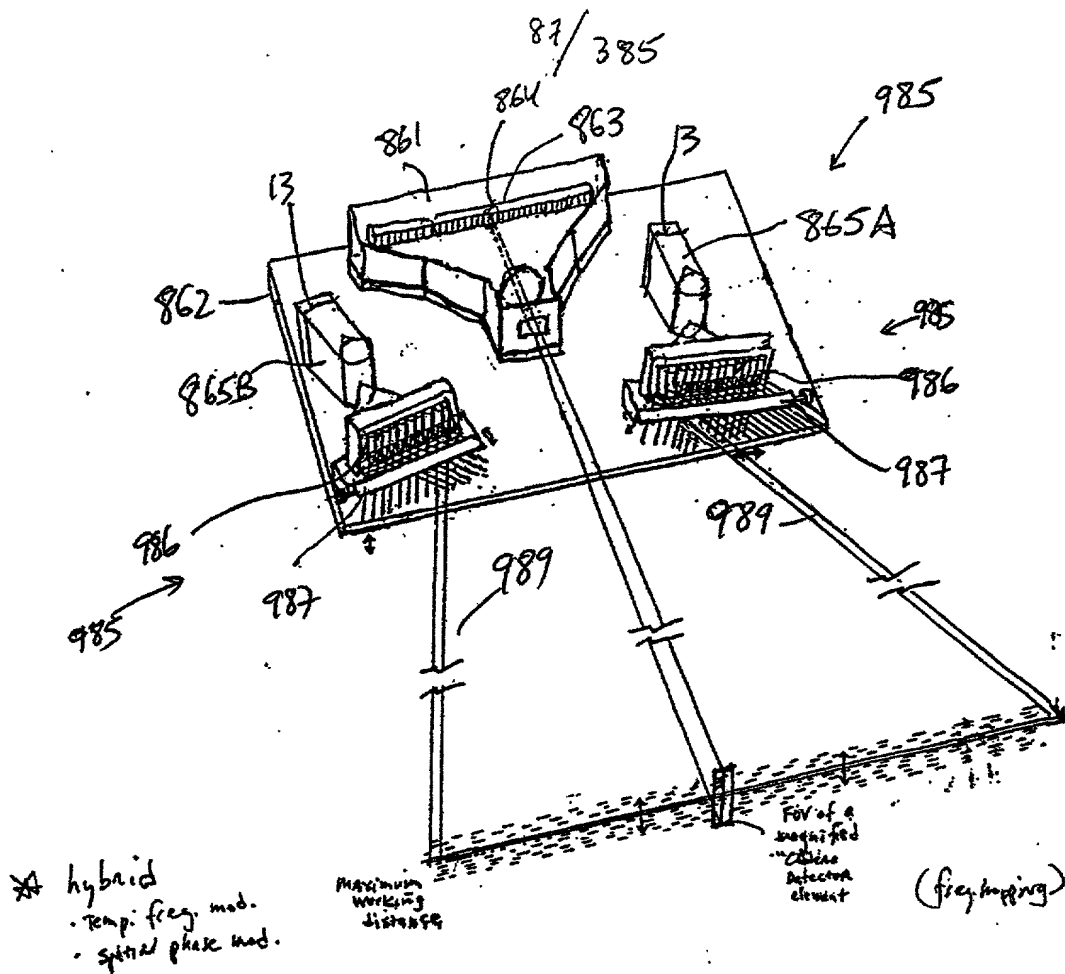


FIG. 1I25M1

\* Transverse magnification of PLIB

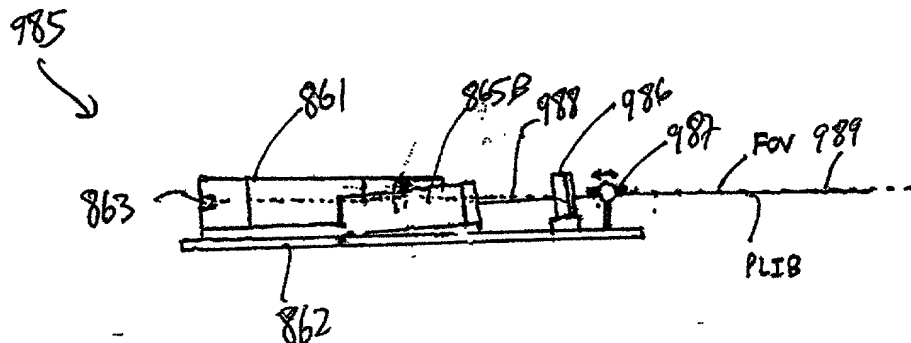


FIG. 1I25M2



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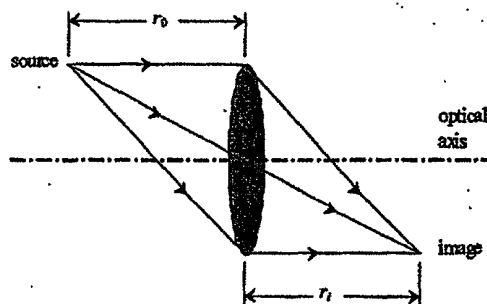


FIG. 1H1

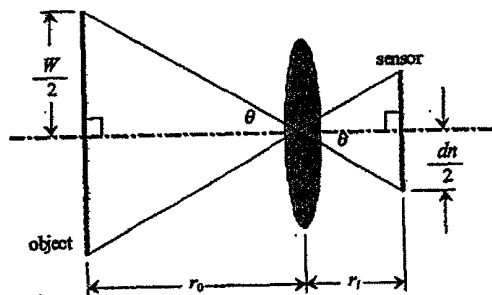


FIG. 1H2

20250201 09:23:39

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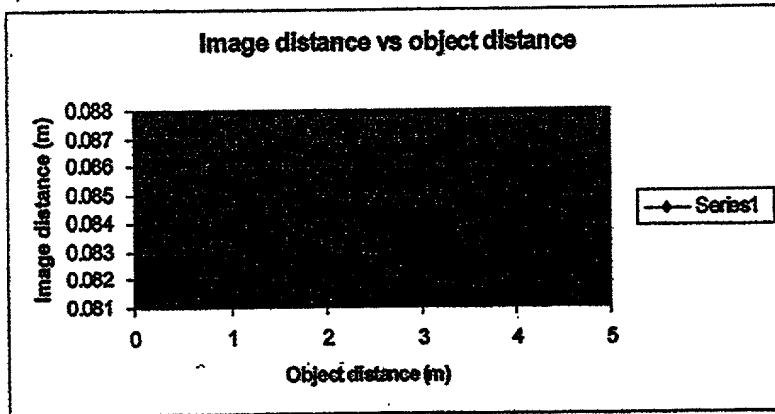


FIG. 1H3

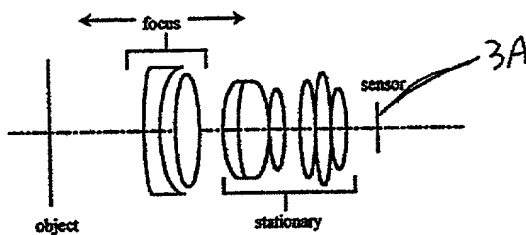


FIG. 1H4

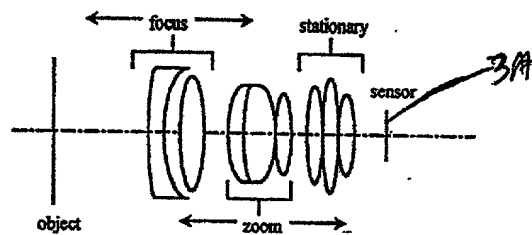
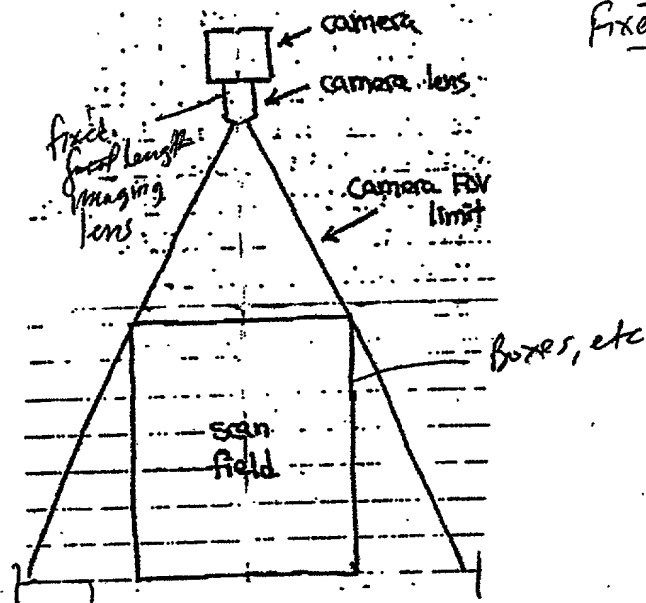


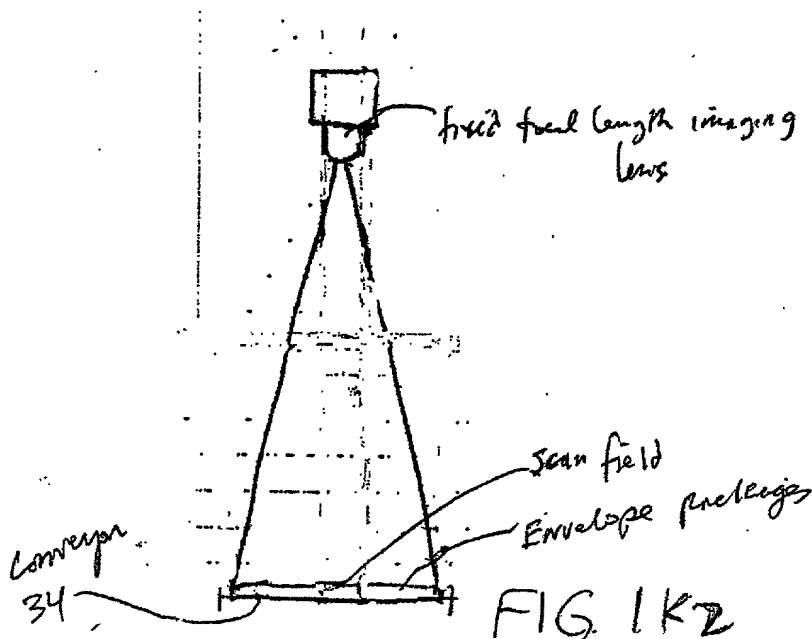
FIG. 1H5

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Fixed focal length lens  
Cases



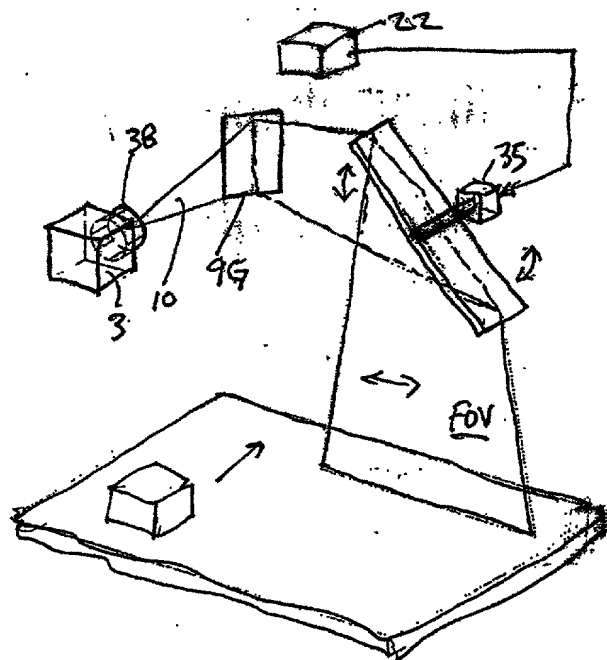
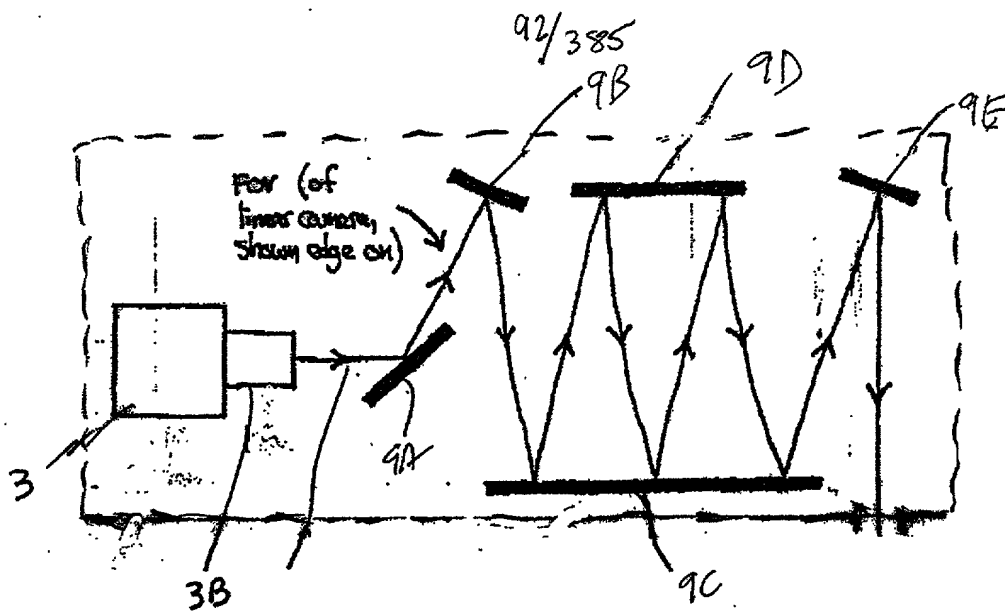
conveyer 34 FIG 1K1



conveyer 34

FIG 1K2

205500 SEE 48004





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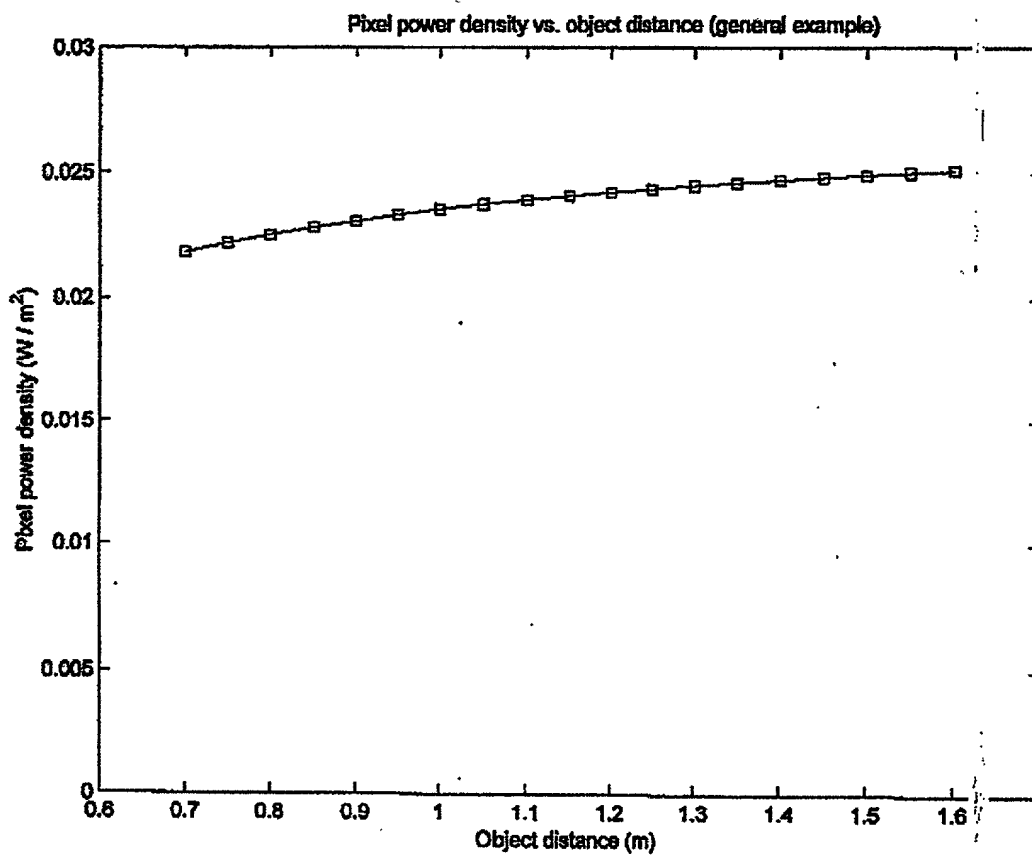


FIG-1M1

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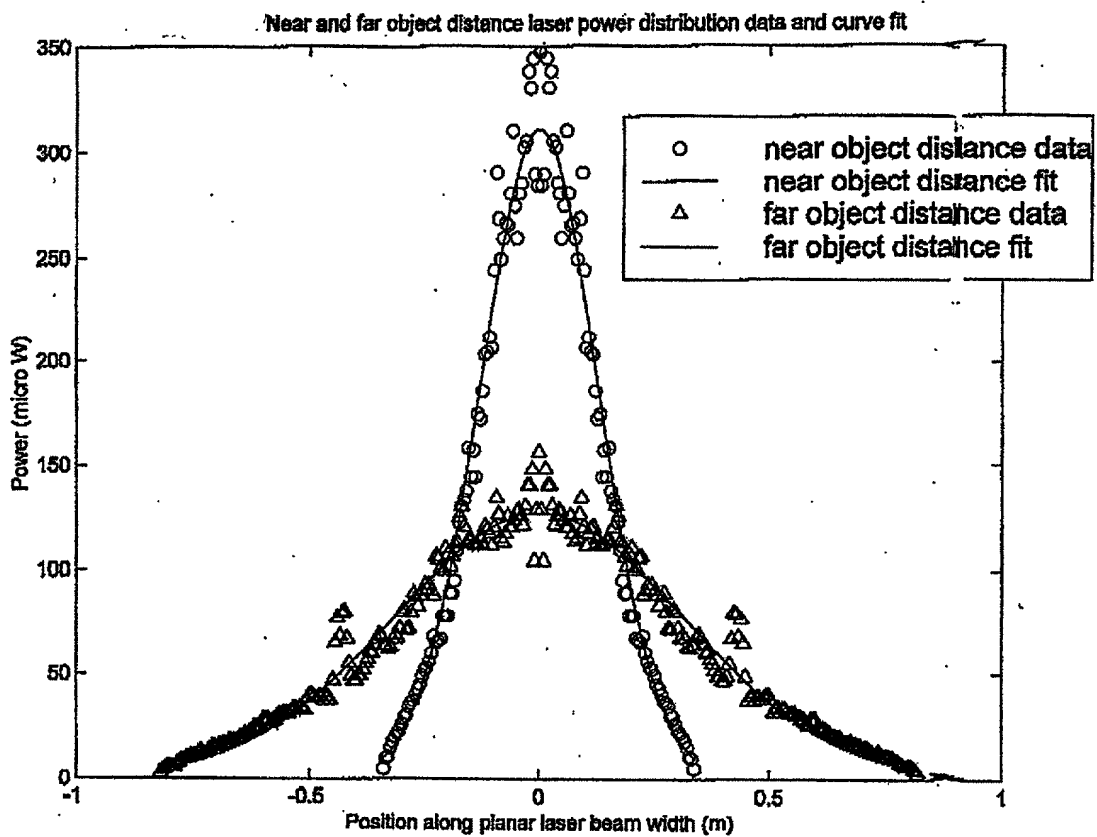


FIG. 1M2

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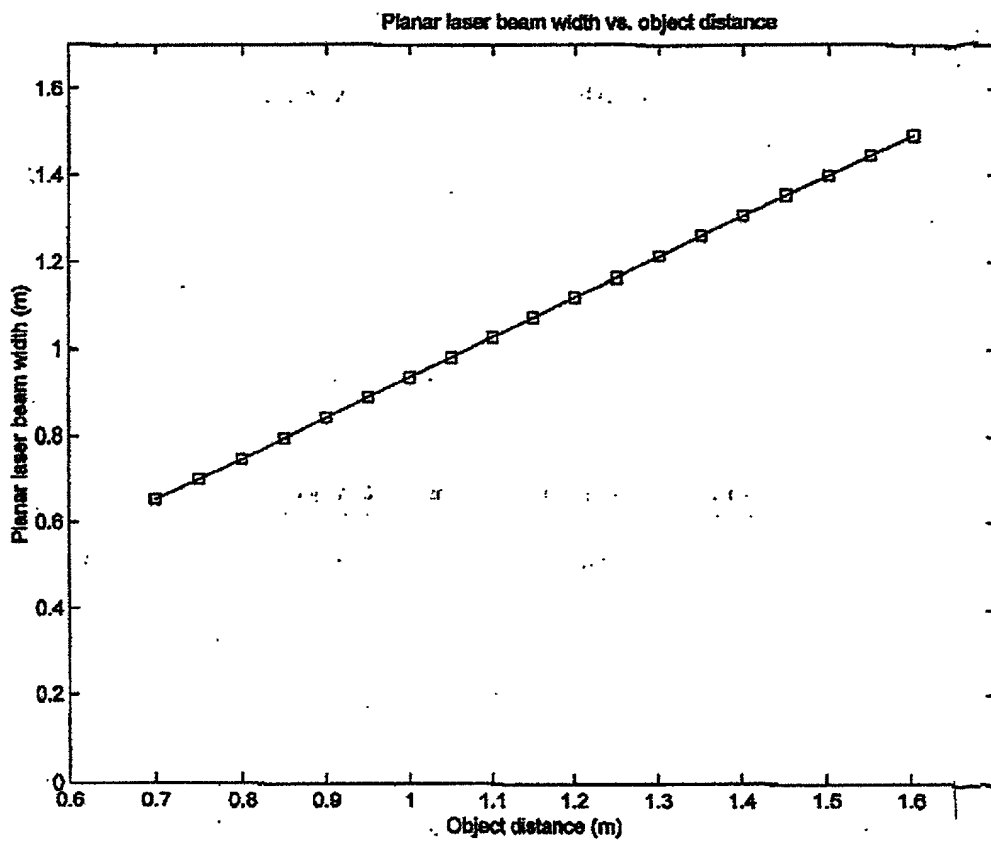


FIG. 1M3

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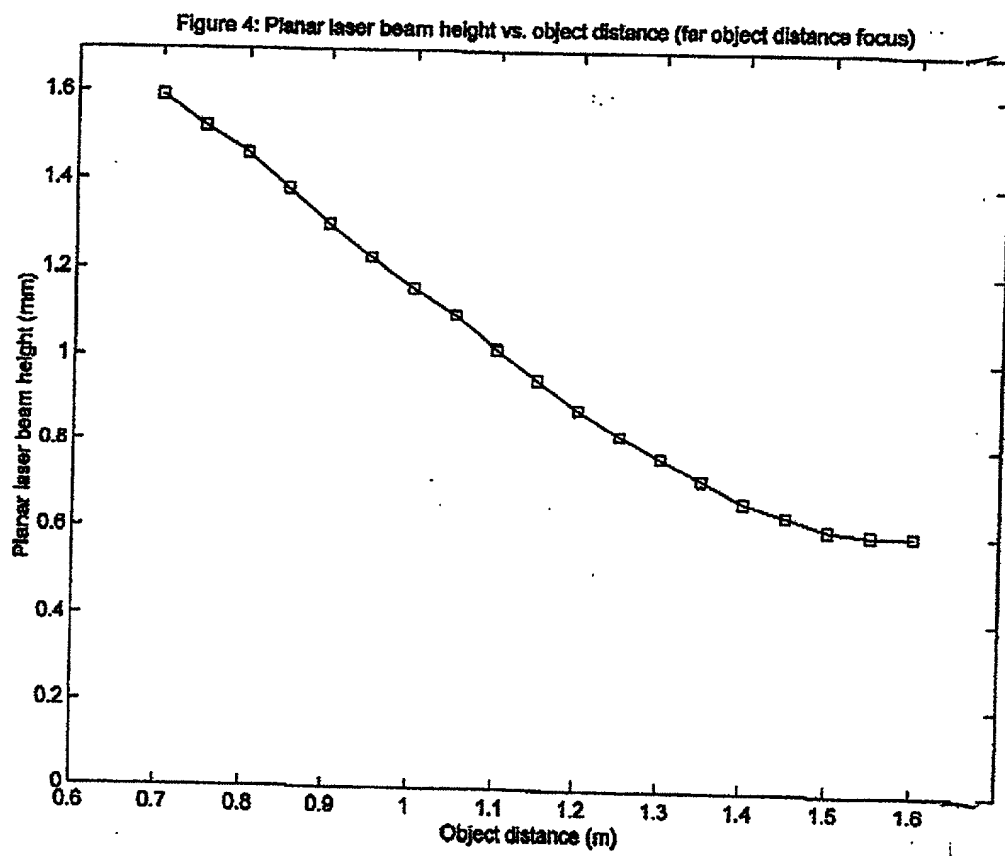


FIG 1M4

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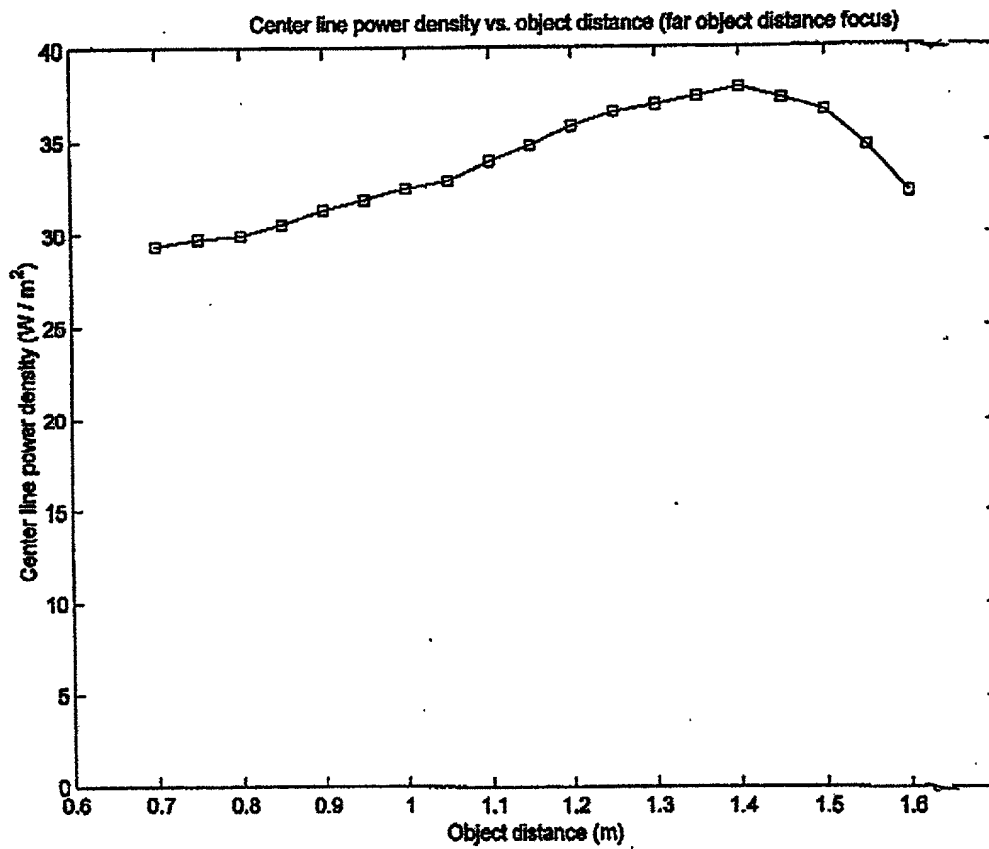


FIG. 1N

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Figure 6: Pixel power densities vs. object distance

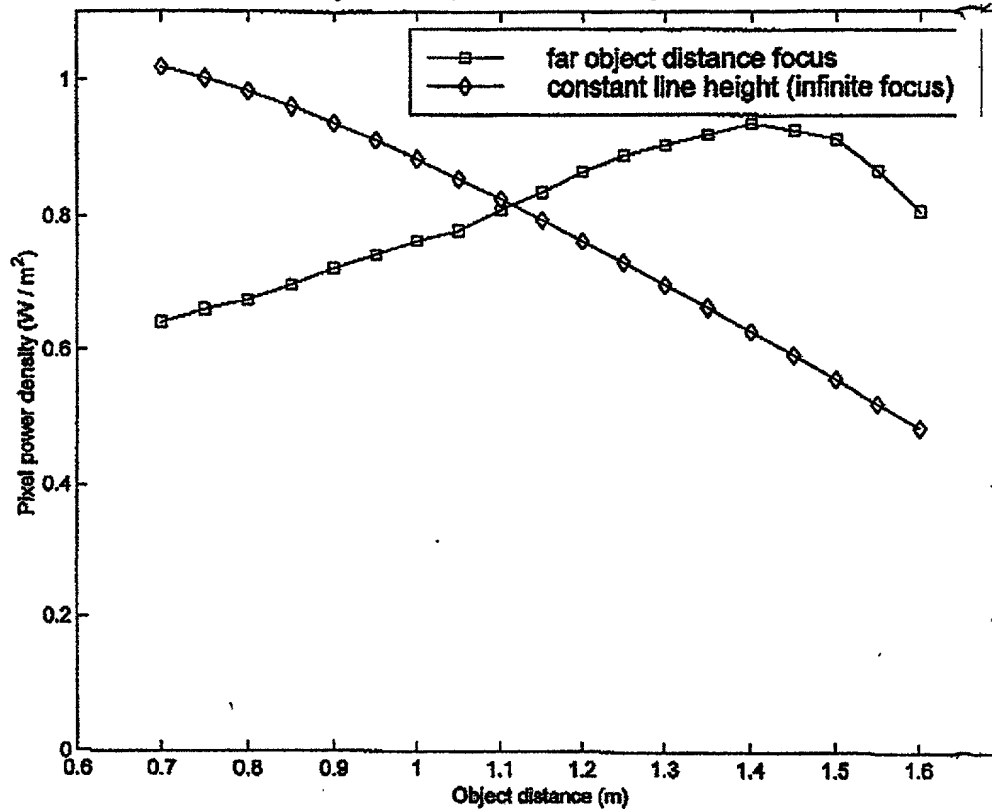
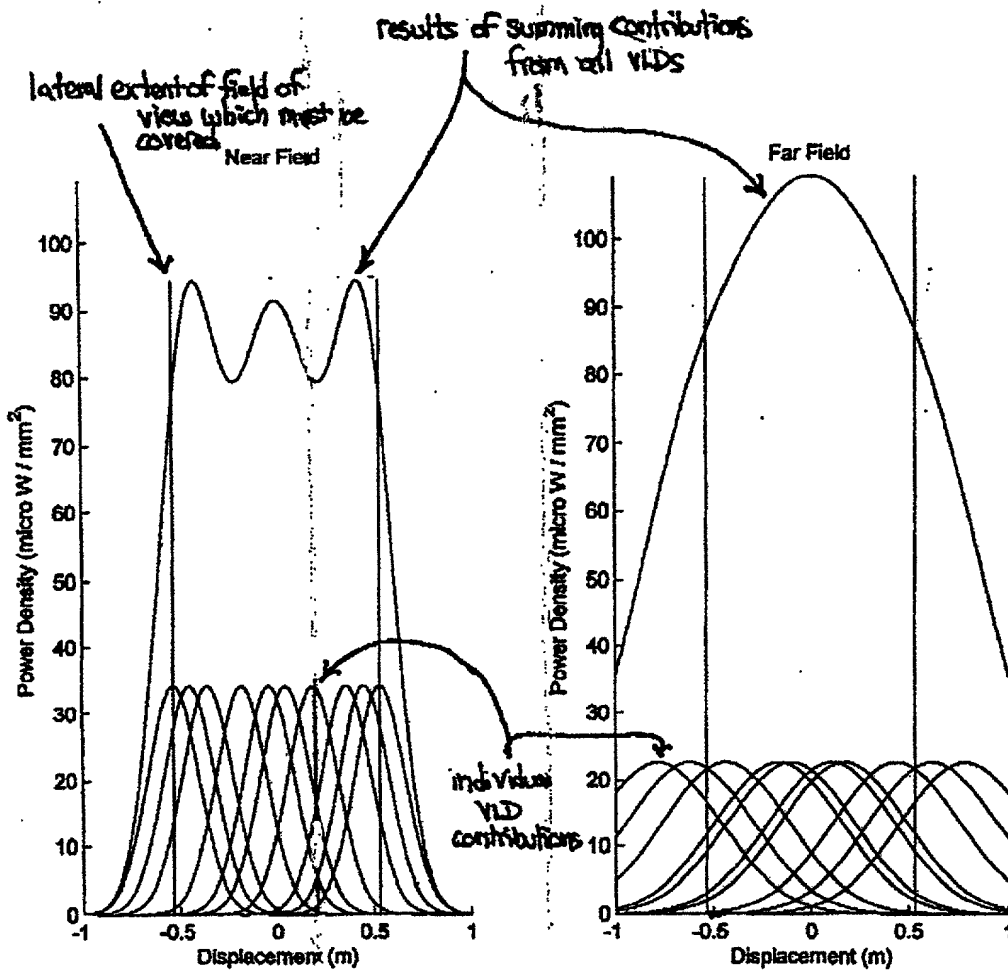


FIG. 10

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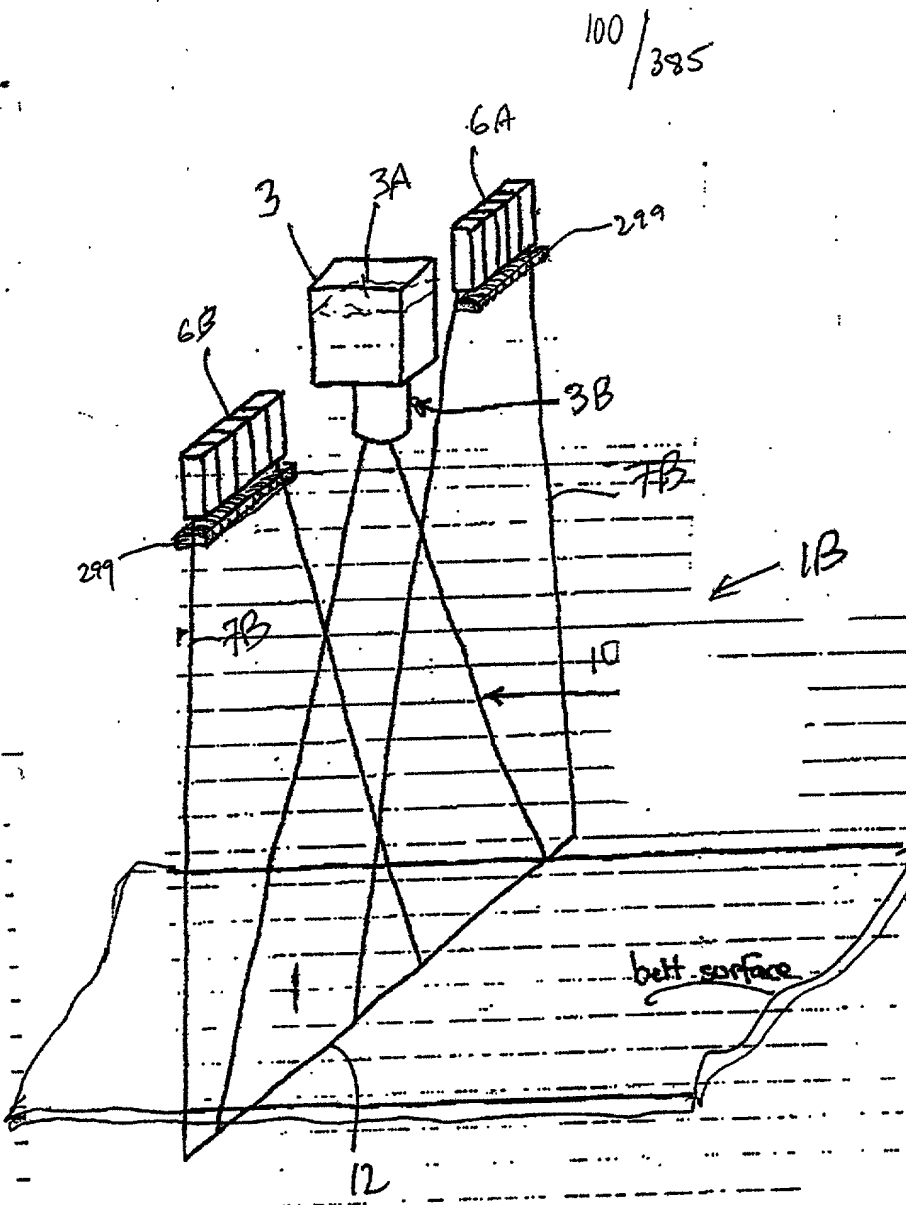


FIG. 101



FIG. 100Z

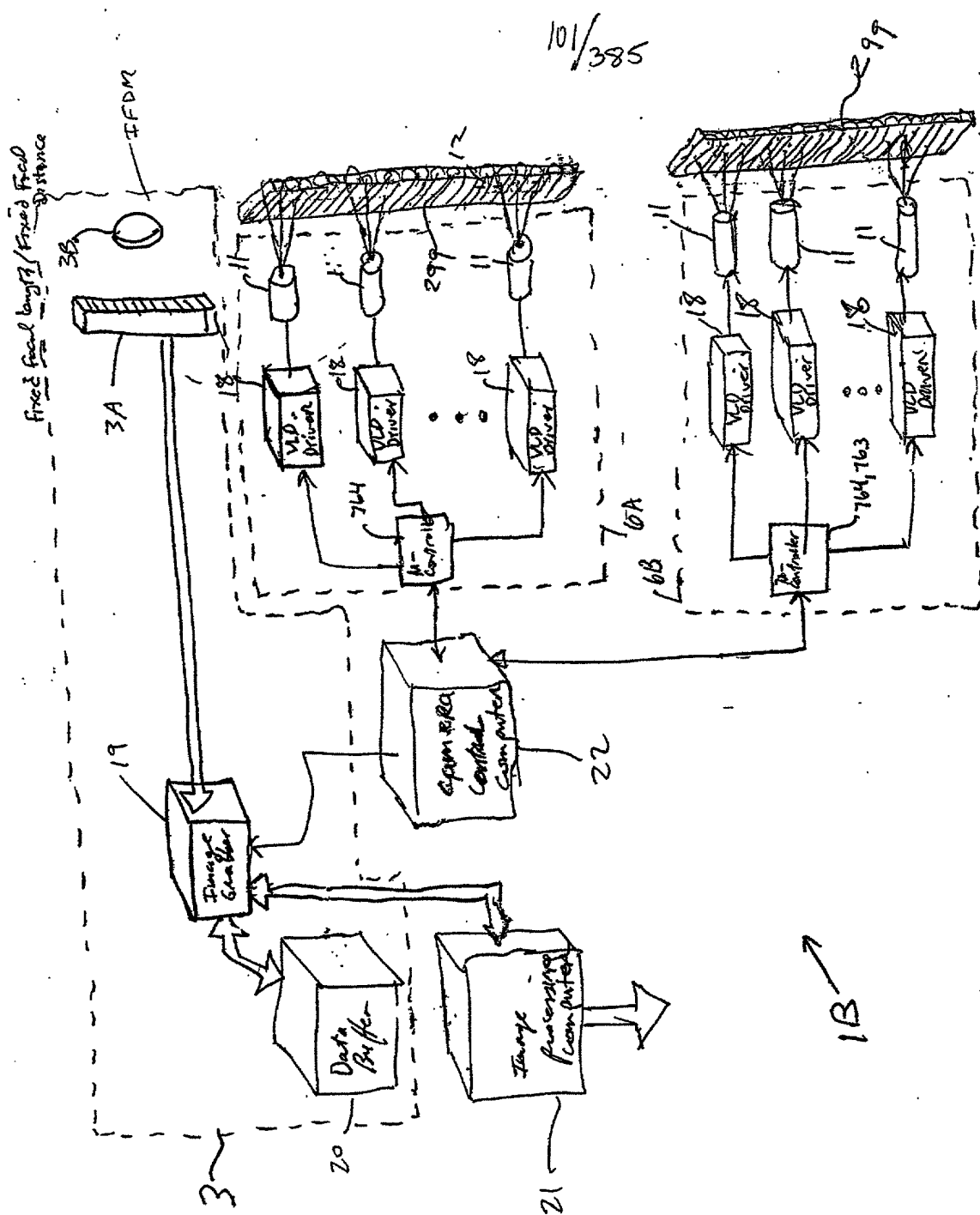
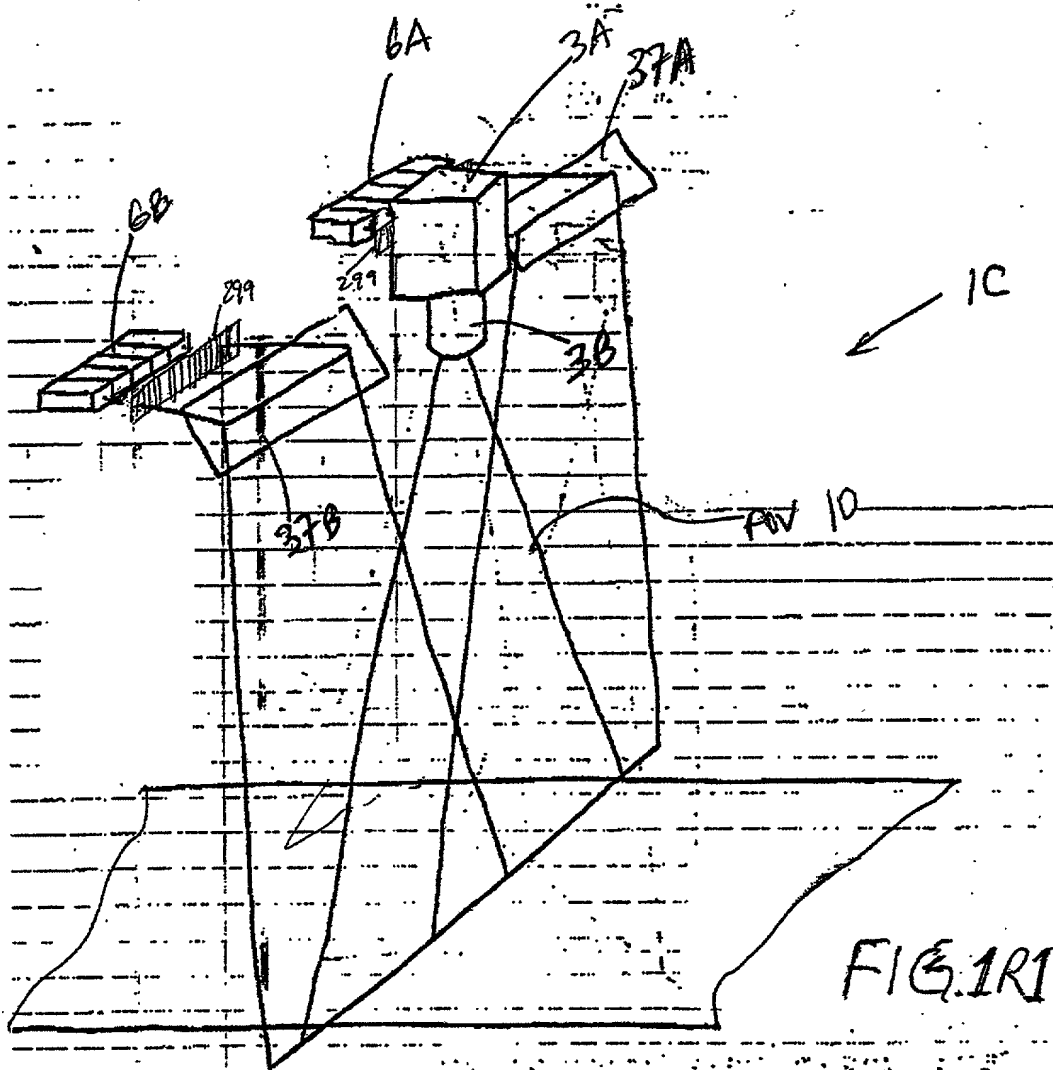


FIG. 100Z

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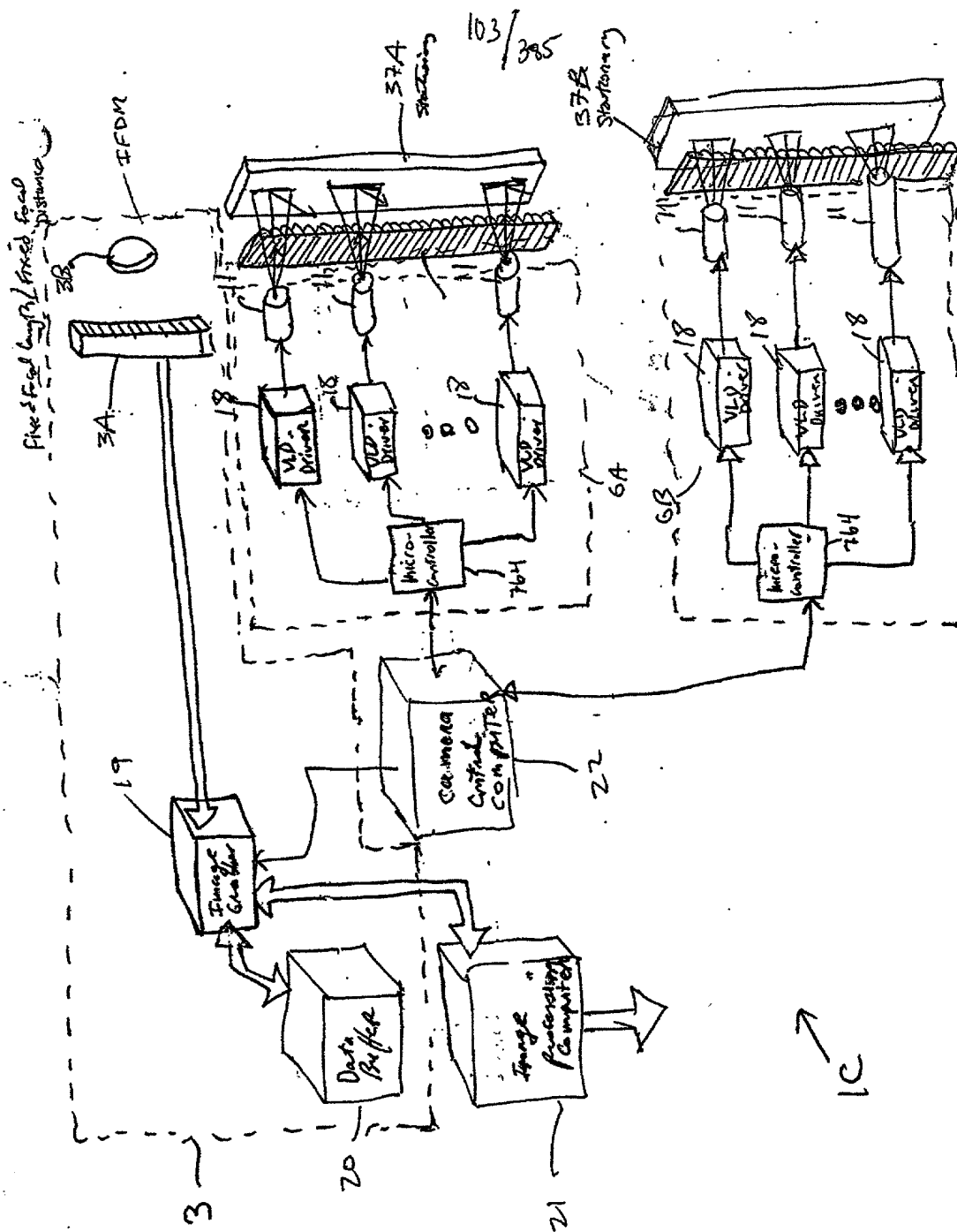


FIG. 1R2

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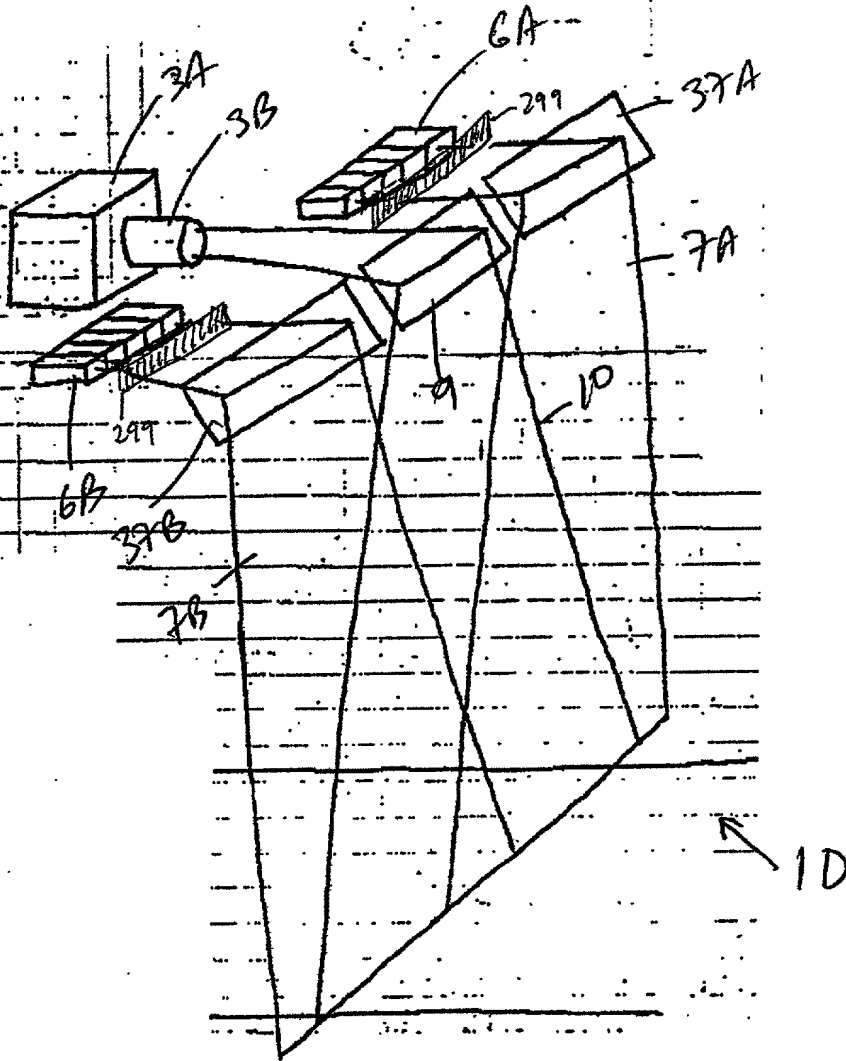


FIG. 1S1



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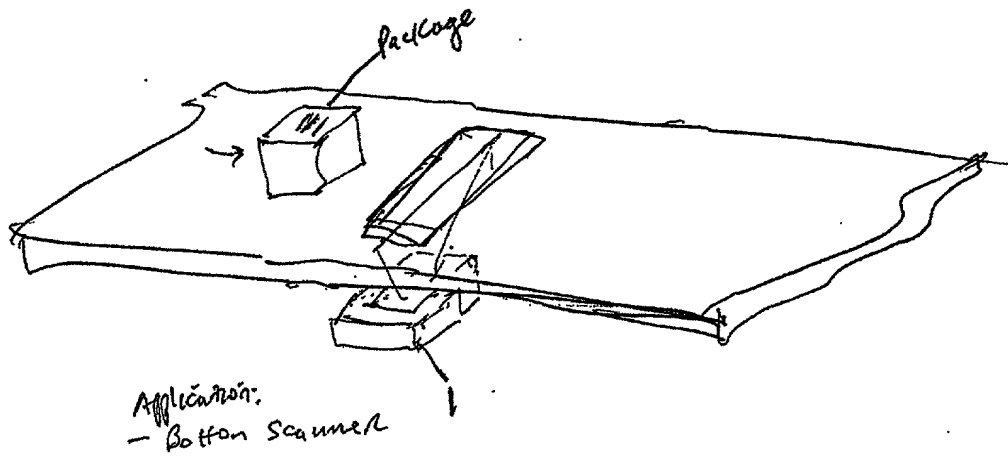
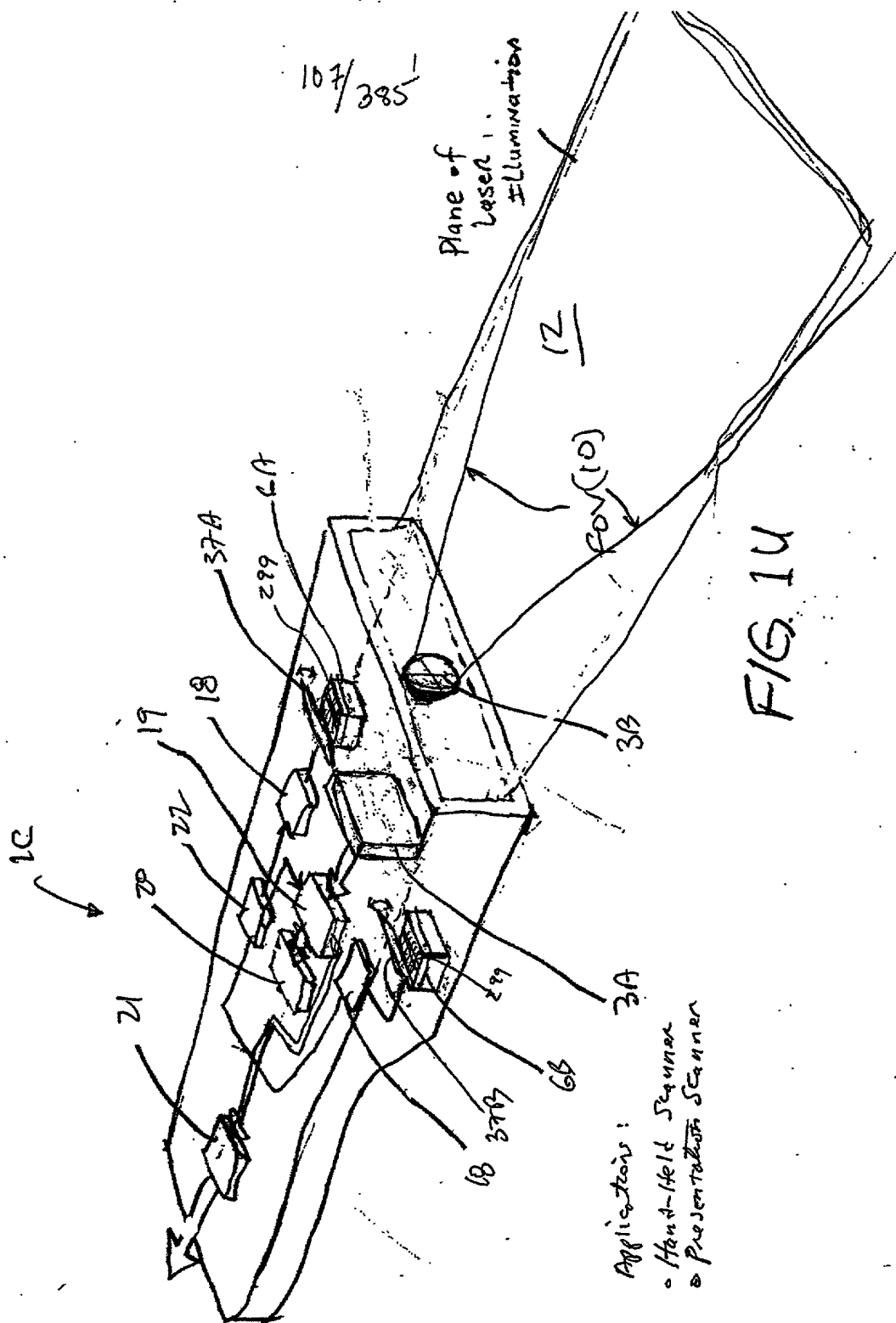


FIG 1T



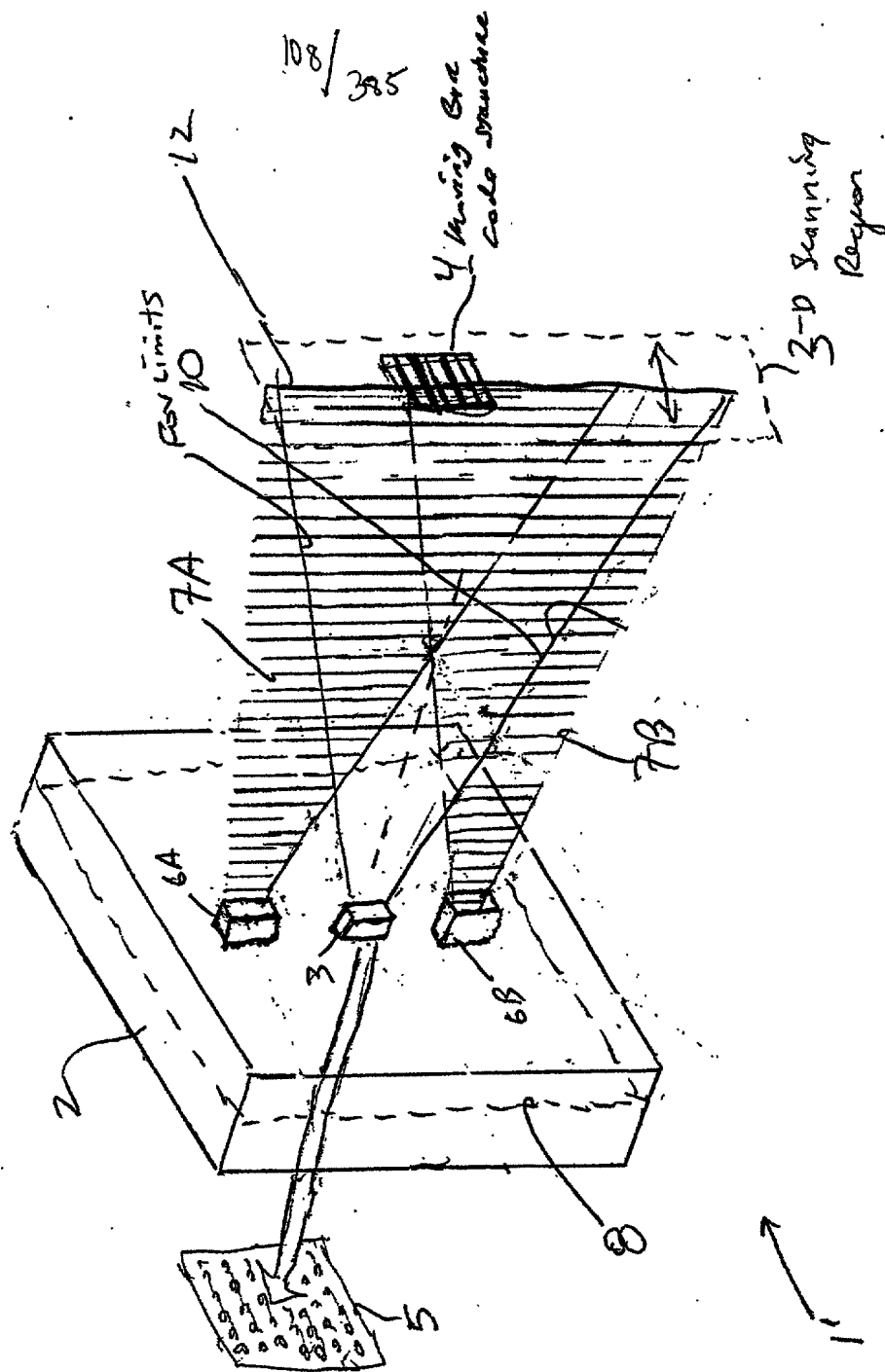


FIG. 1VI



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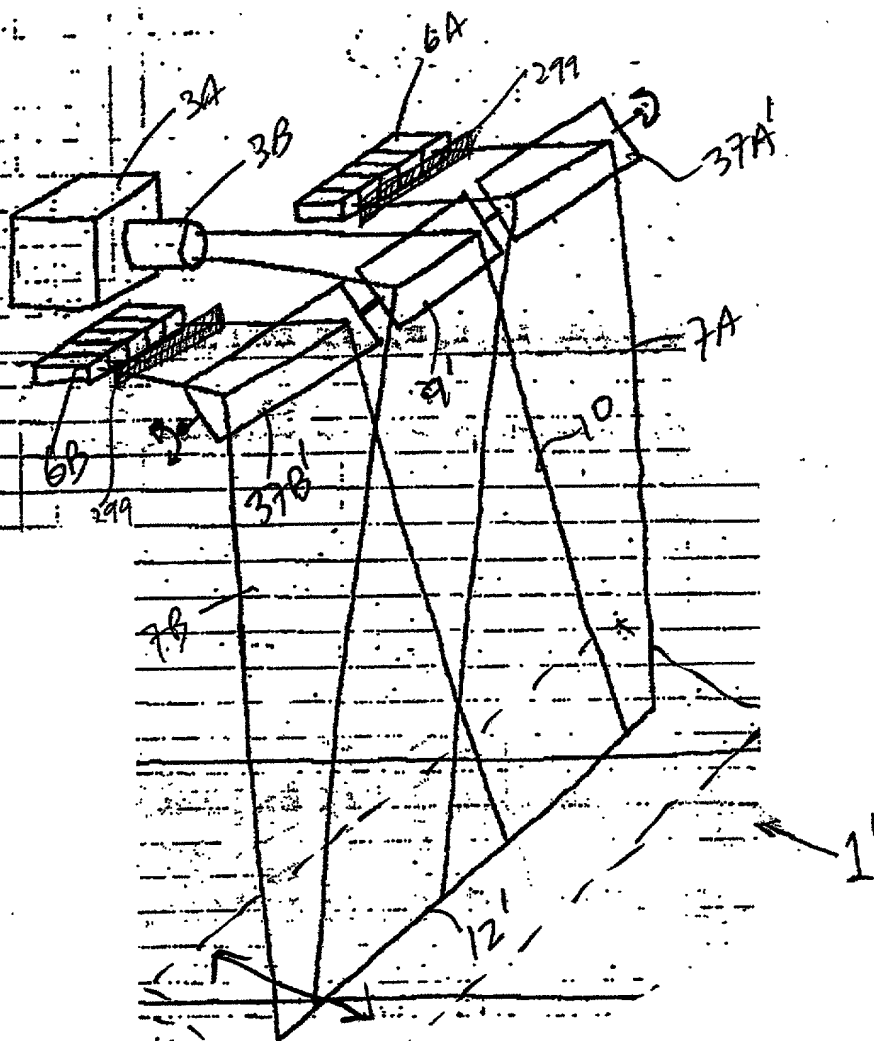


FIG. IV2

2-D  
region  
of  
space

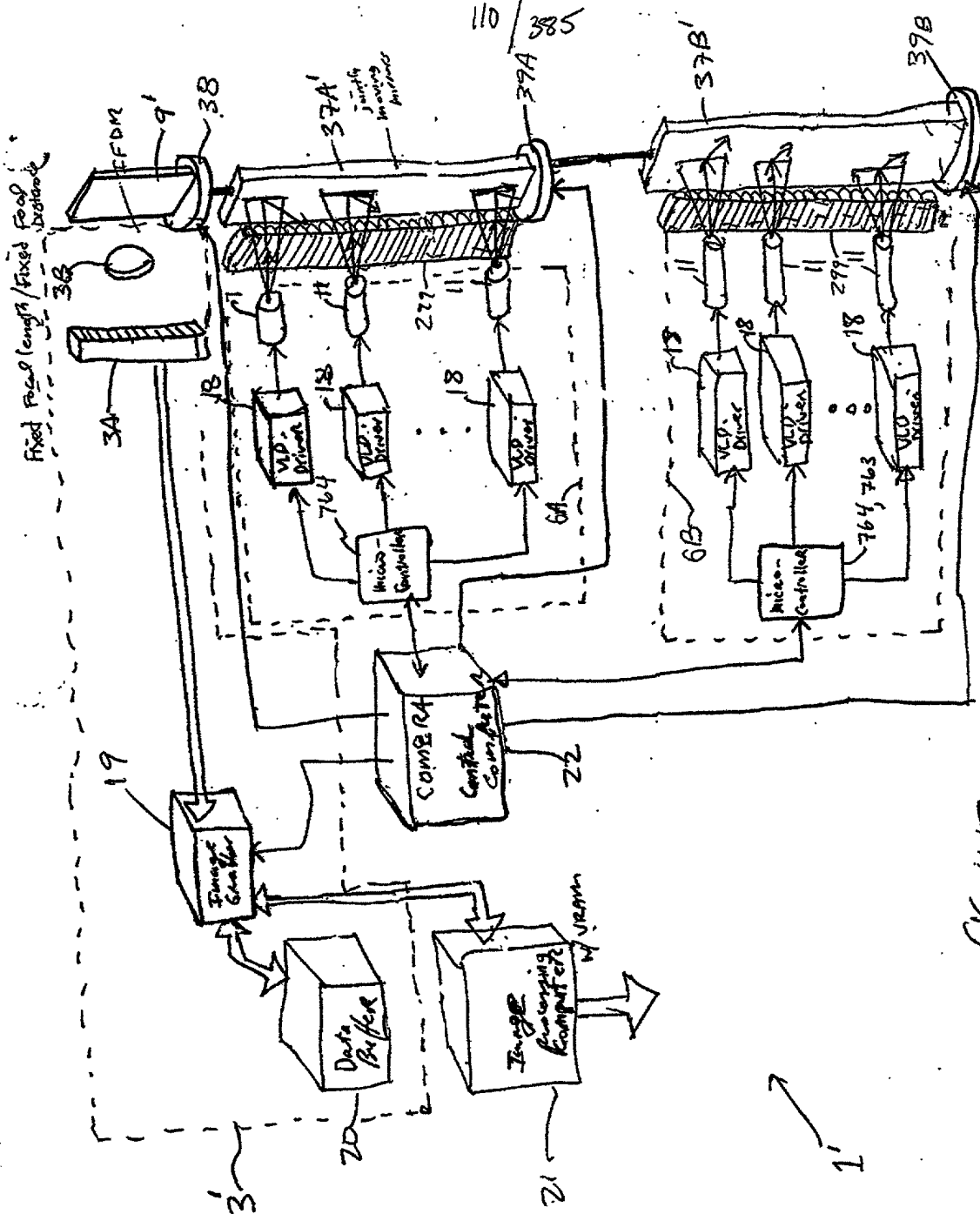


Fig. 1V3

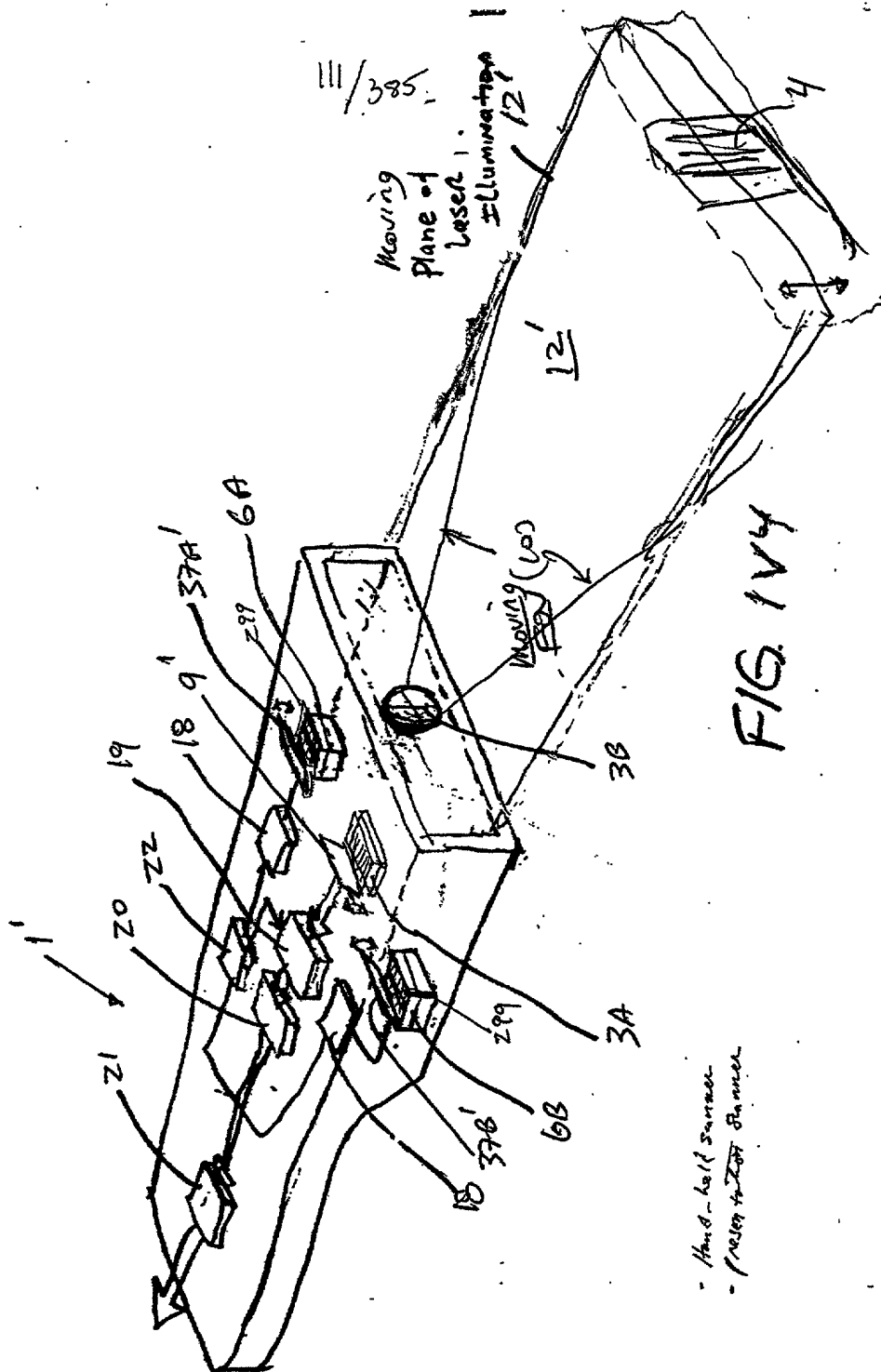
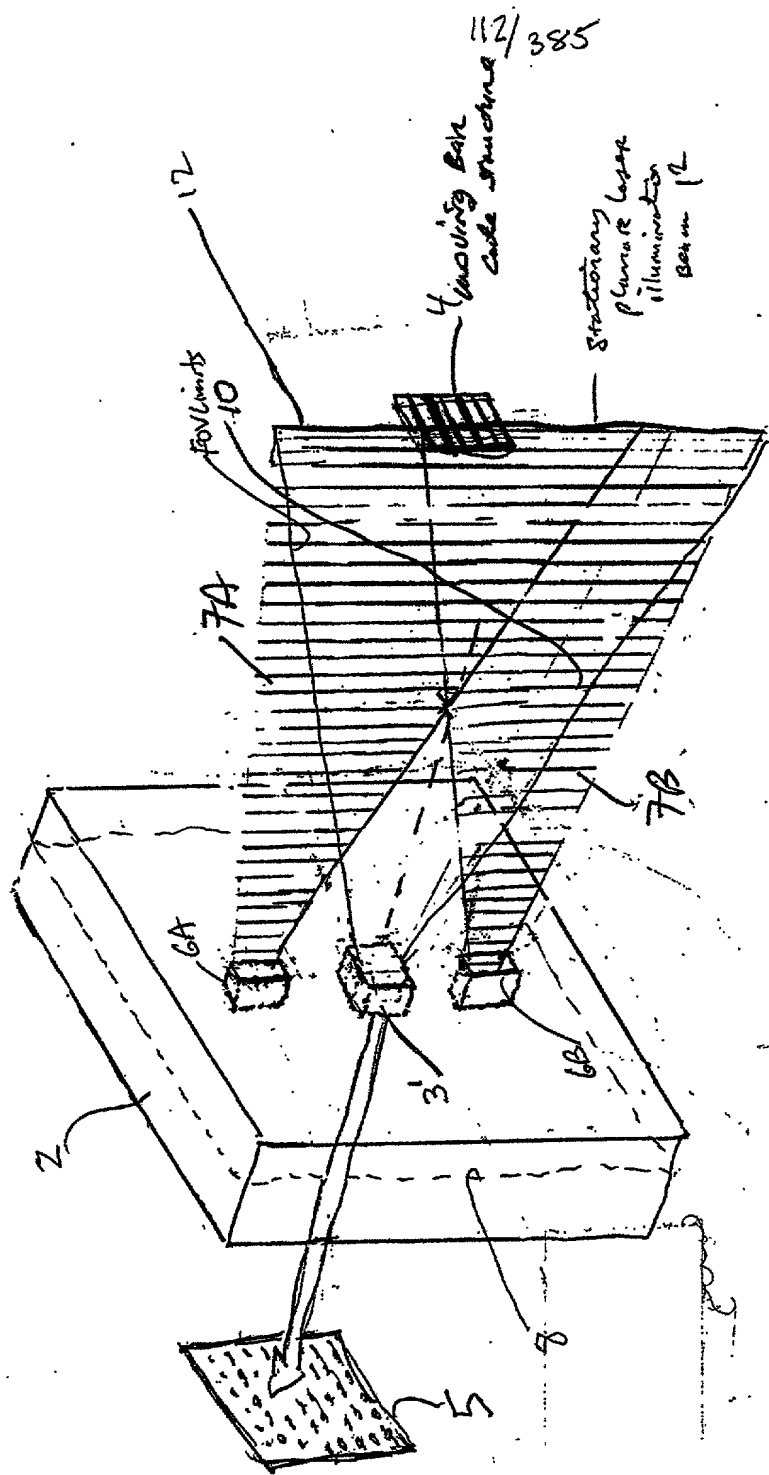


FIG. 1V4

- Hand-held sensor  
- Pressure transducer



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Moving Belt  
code structure

Stationary plane  
laser  
illumination  
beam 12

FIG. 2A

40

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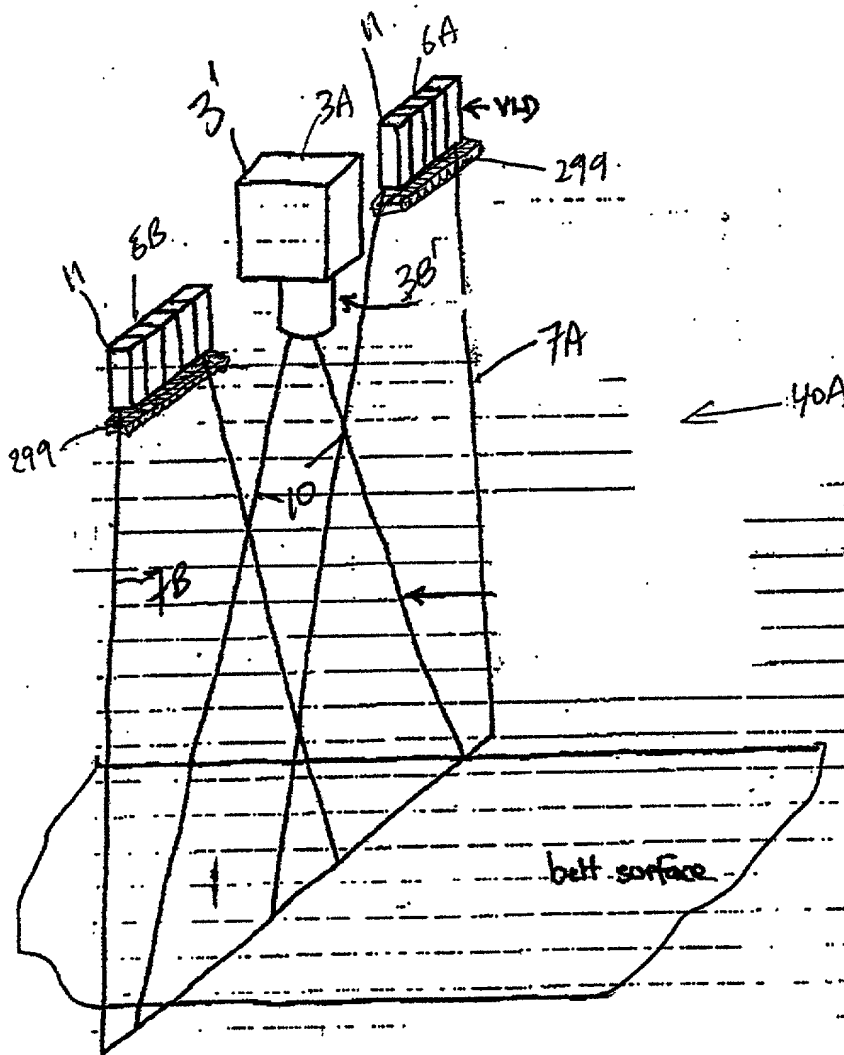


FIG. 2B1

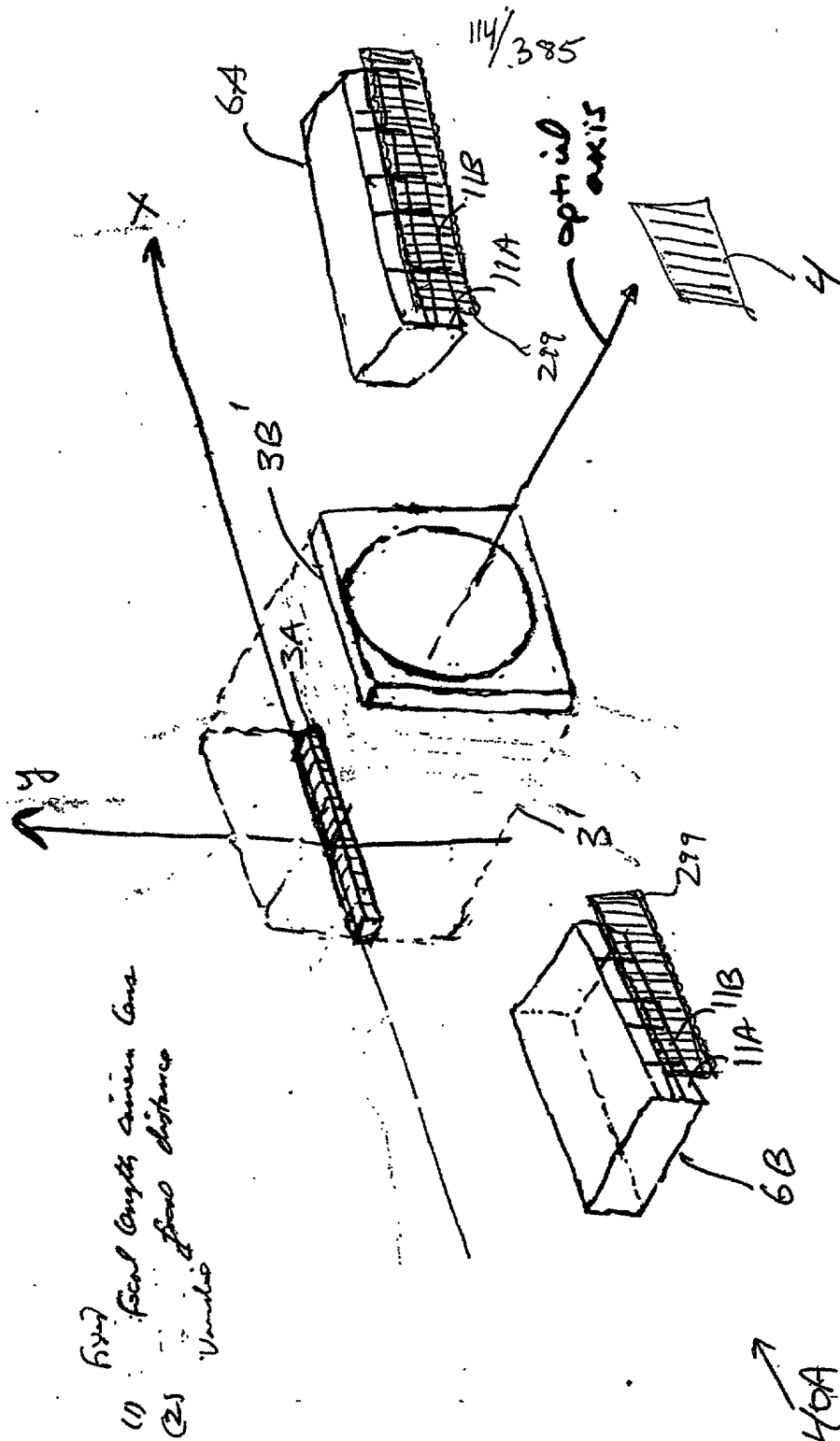
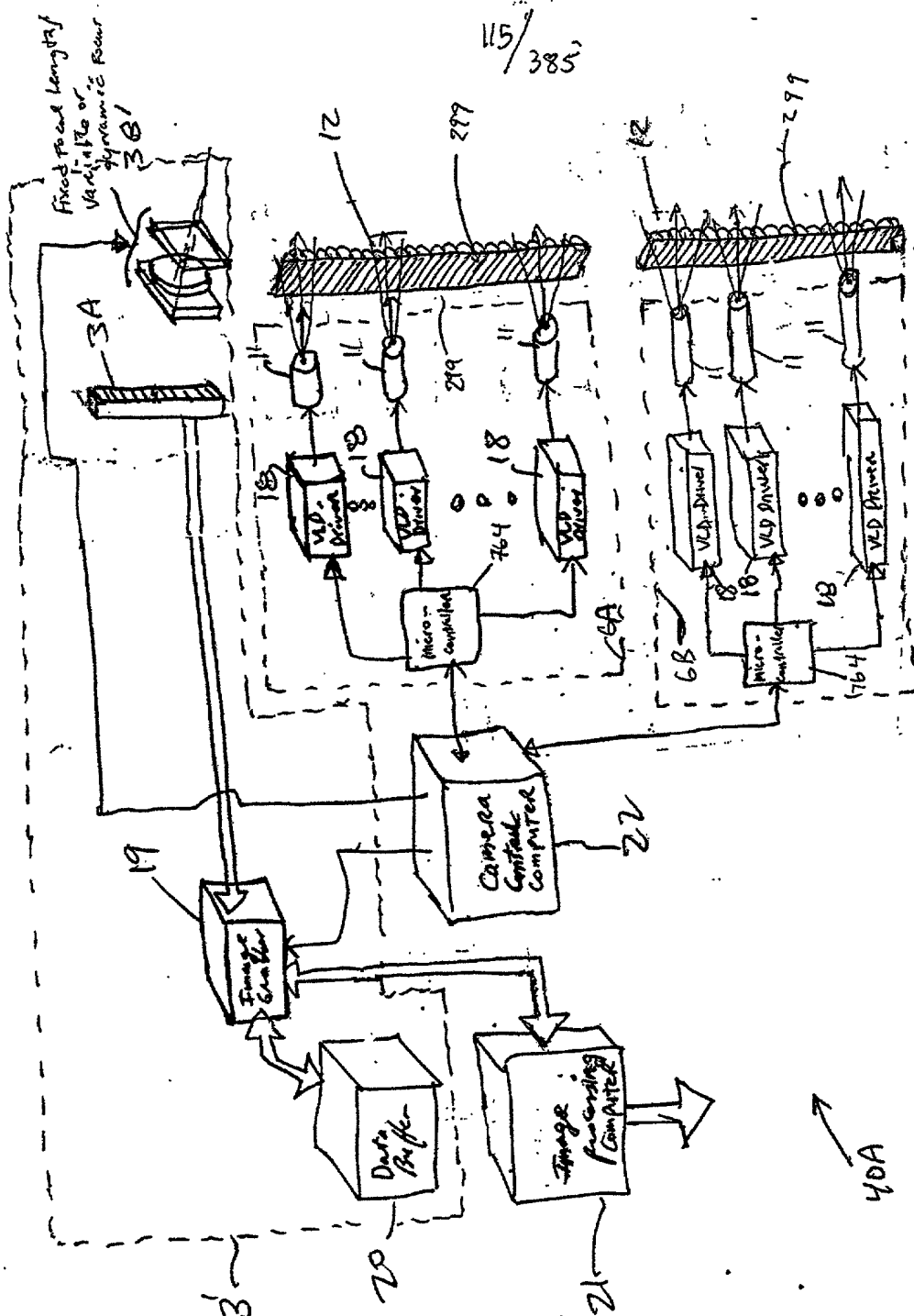


FIG. 2B2

[illegible]
$$115 / 385$$

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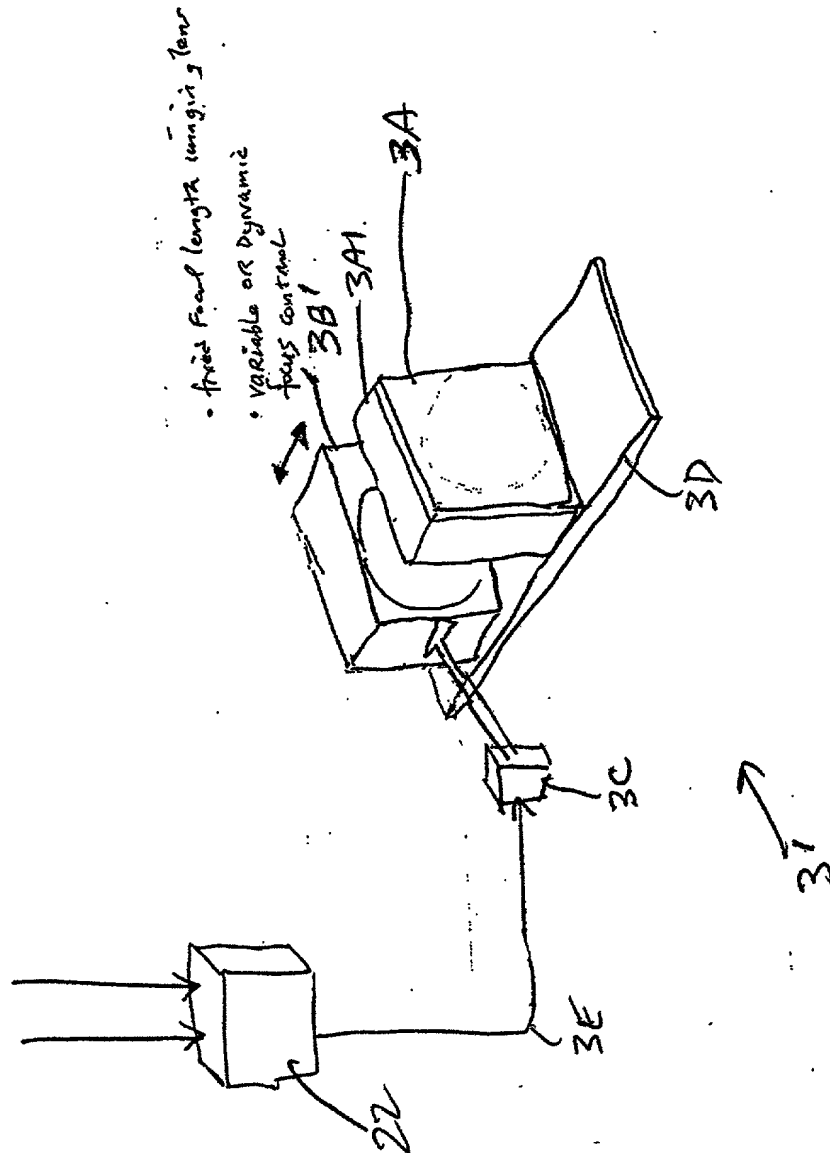


FIG. 2C2



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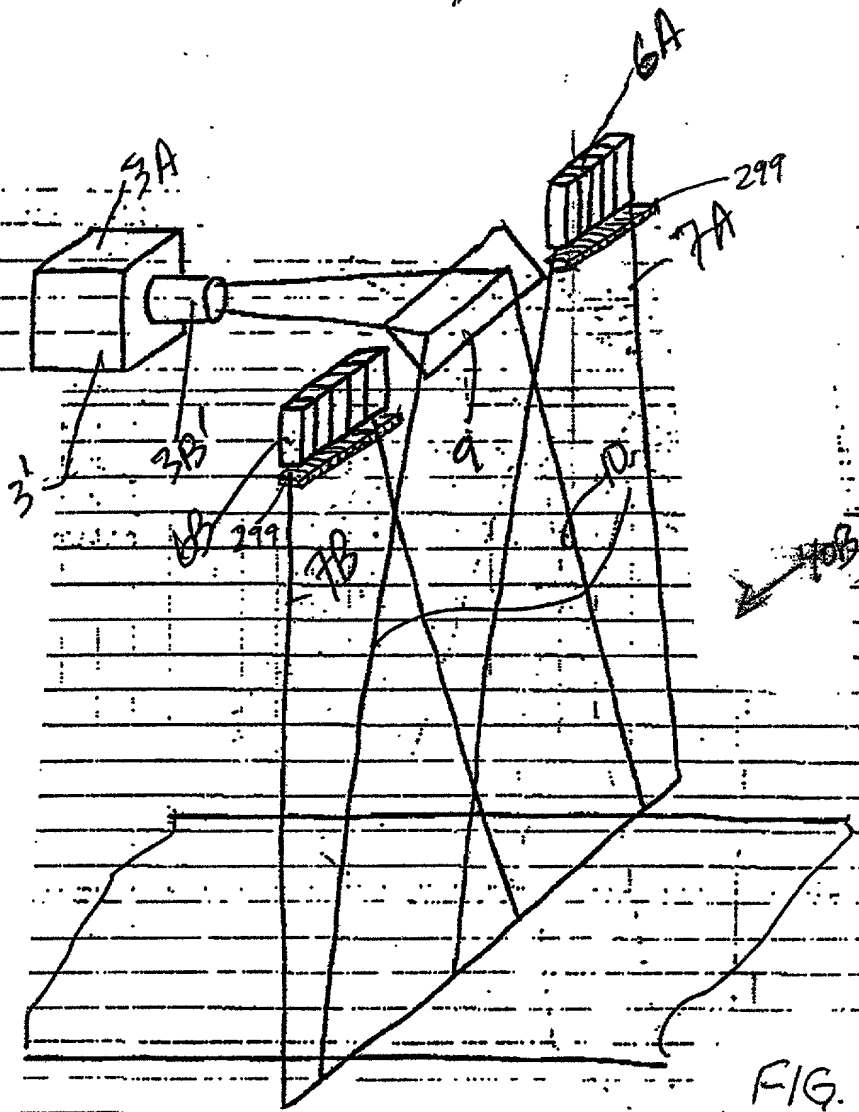


FIG. 2D1

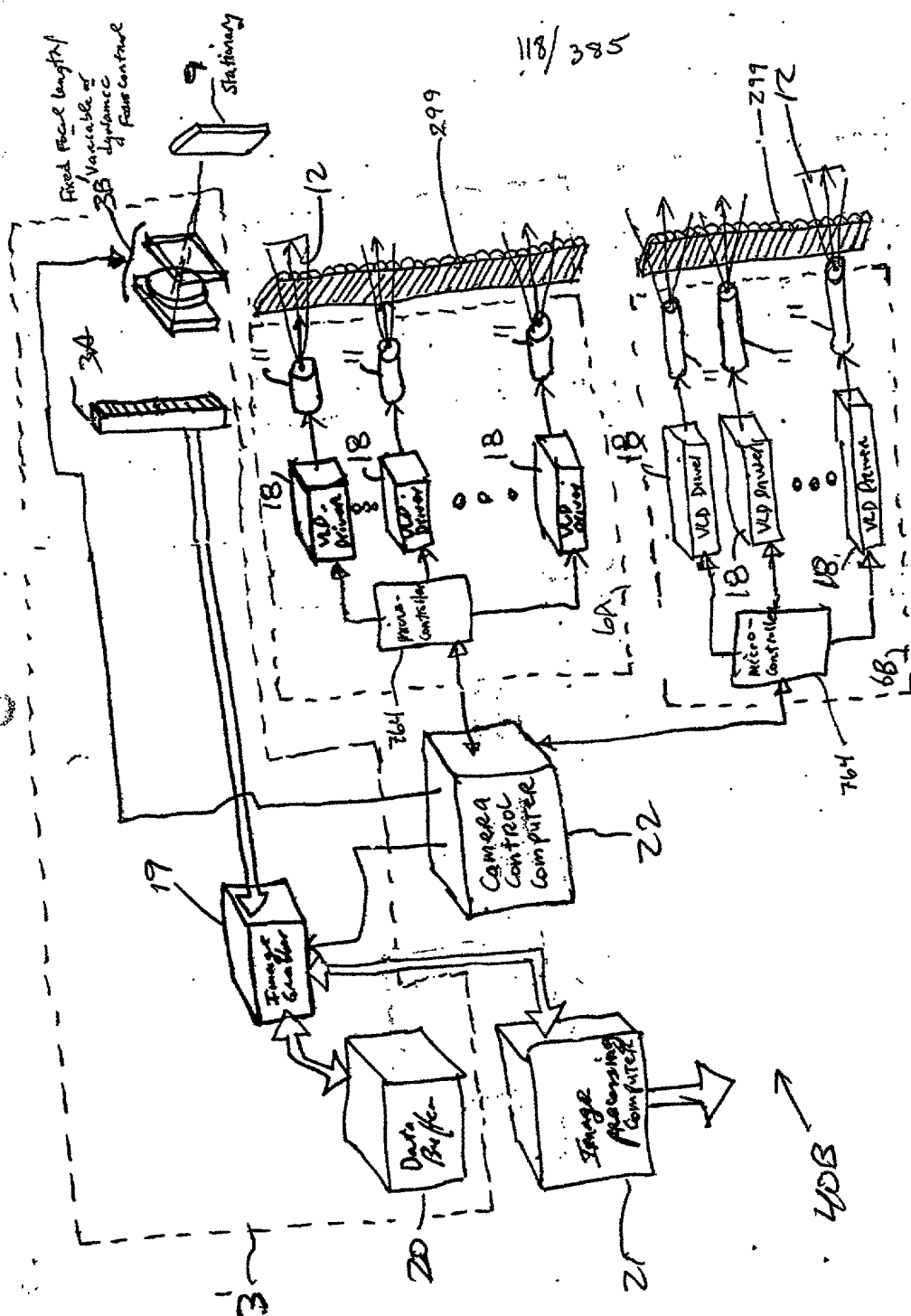


FIG. 2D2

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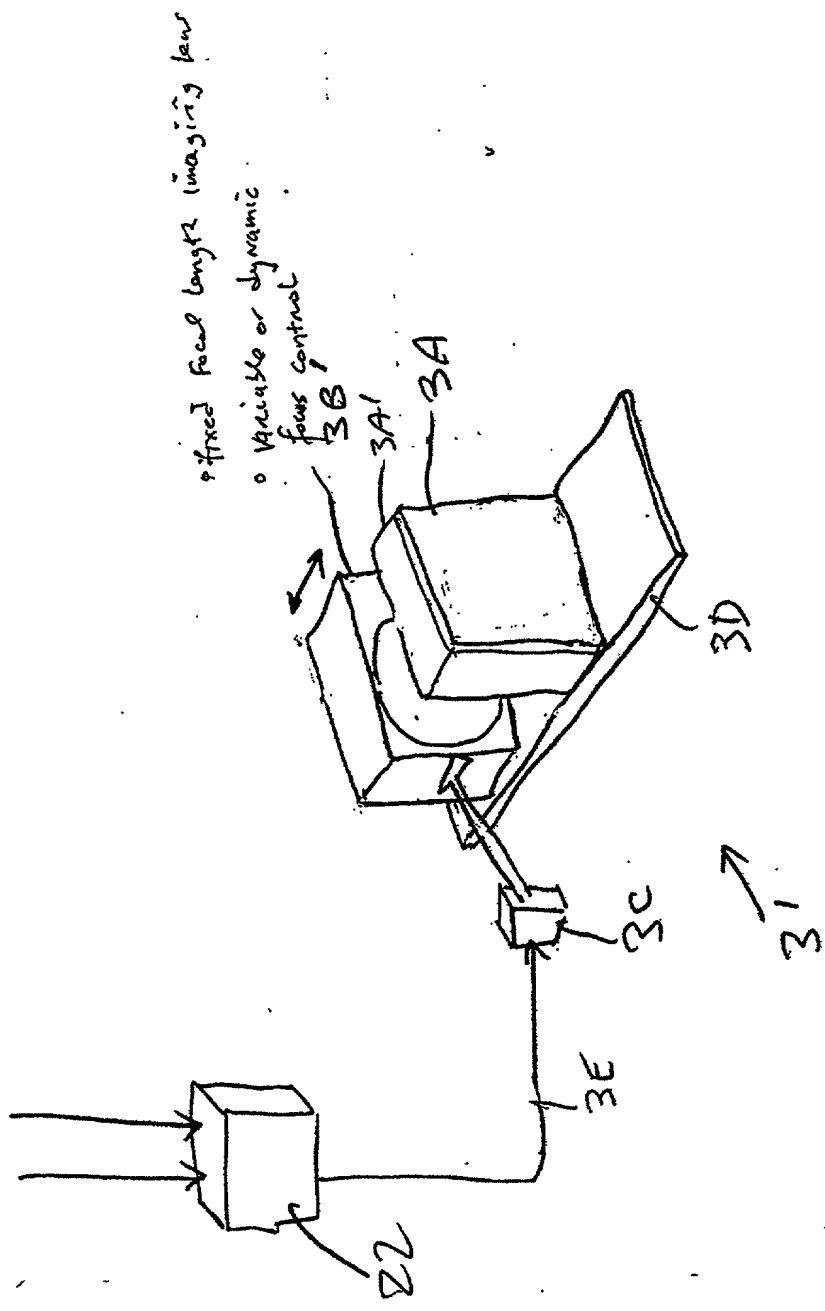


FIG. 2D3

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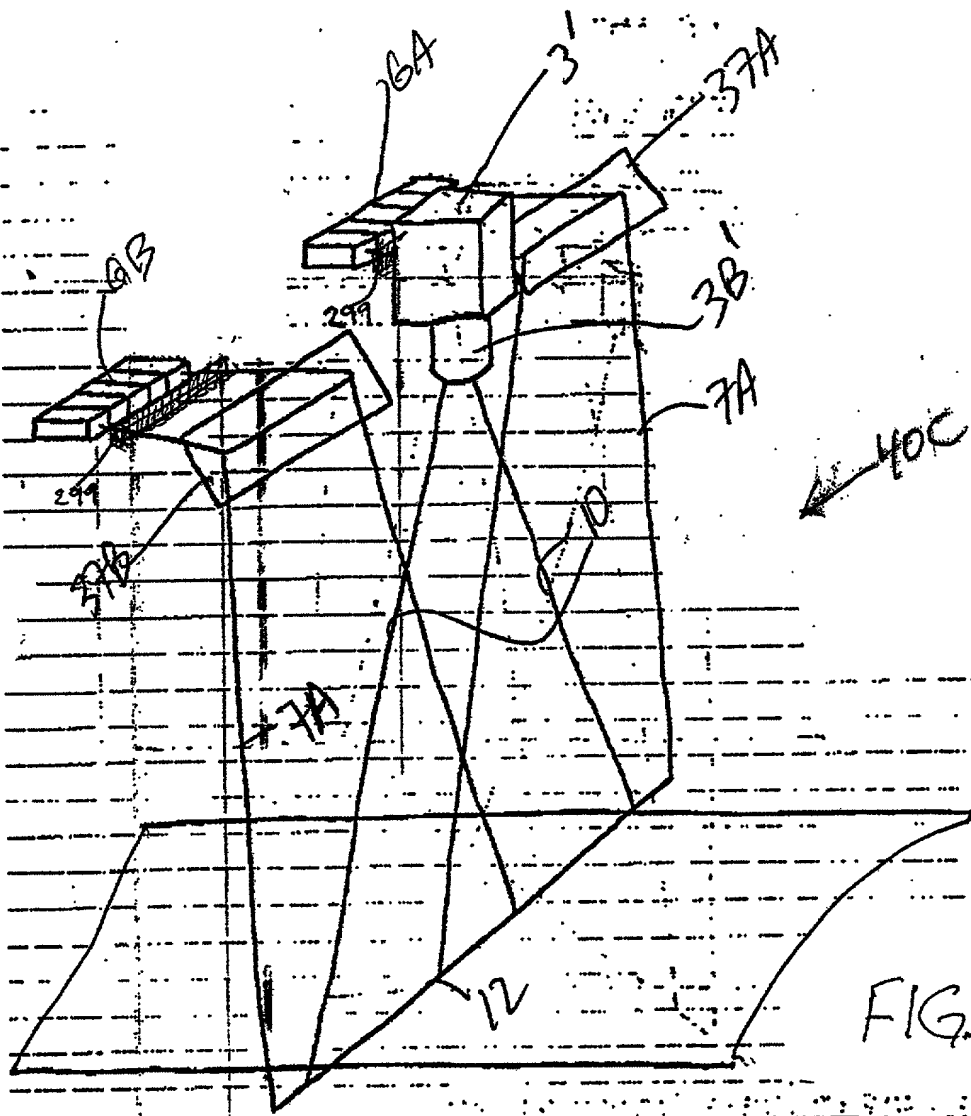


FIG. 2E1

DATE	DESCRIPTION	AMOUNT	BALANCE
1890	Jan 1		100.00
	Feb 1	10.00	90.00
	Mar 1	20.00	70.00
	Apr 1	30.00	40.00
	May 1	40.00	0.00
	Jun 1	50.00	50.00
	Jul 1	60.00	110.00
	Aug 1	70.00	180.00
	Sep 1	80.00	260.00
	Oct 1	90.00	350.00
	Nov 1	100.00	450.00
	Dec 1	110.00	560.00
1891	Jan 1	120.00	680.00
	Feb 1	130.00	810.00
	Mar 1	140.00	950.00
	Apr 1	150.00	1100.00
	May 1	160.00	1260.00
	Jun 1	170.00	1430.00
	Jul 1	180.00	1610.00
	Aug 1	190.00	1800.00
	Sep 1	200.00	2000.00
	Oct 1	210.00	2210.00
	Nov 1	220.00	2430.00
	Dec 1	230.00	2660.00
1892	Jan 1	240.00	2900.00
	Feb 1	250.00	3150.00
	Mar 1	260.00	3410.00
	Apr 1	270.00	3680.00
	May 1	280.00	3960.00
	Jun 1	290.00	4250.00
	Jul 1	300.00	4550.00
	Aug 1	310.00	4860.00
	Sep 1	320.00	5180.00
	Oct 1	330.00	5510.00
	Nov 1	340.00	5850.00
	Dec 1	350.00	6200.00

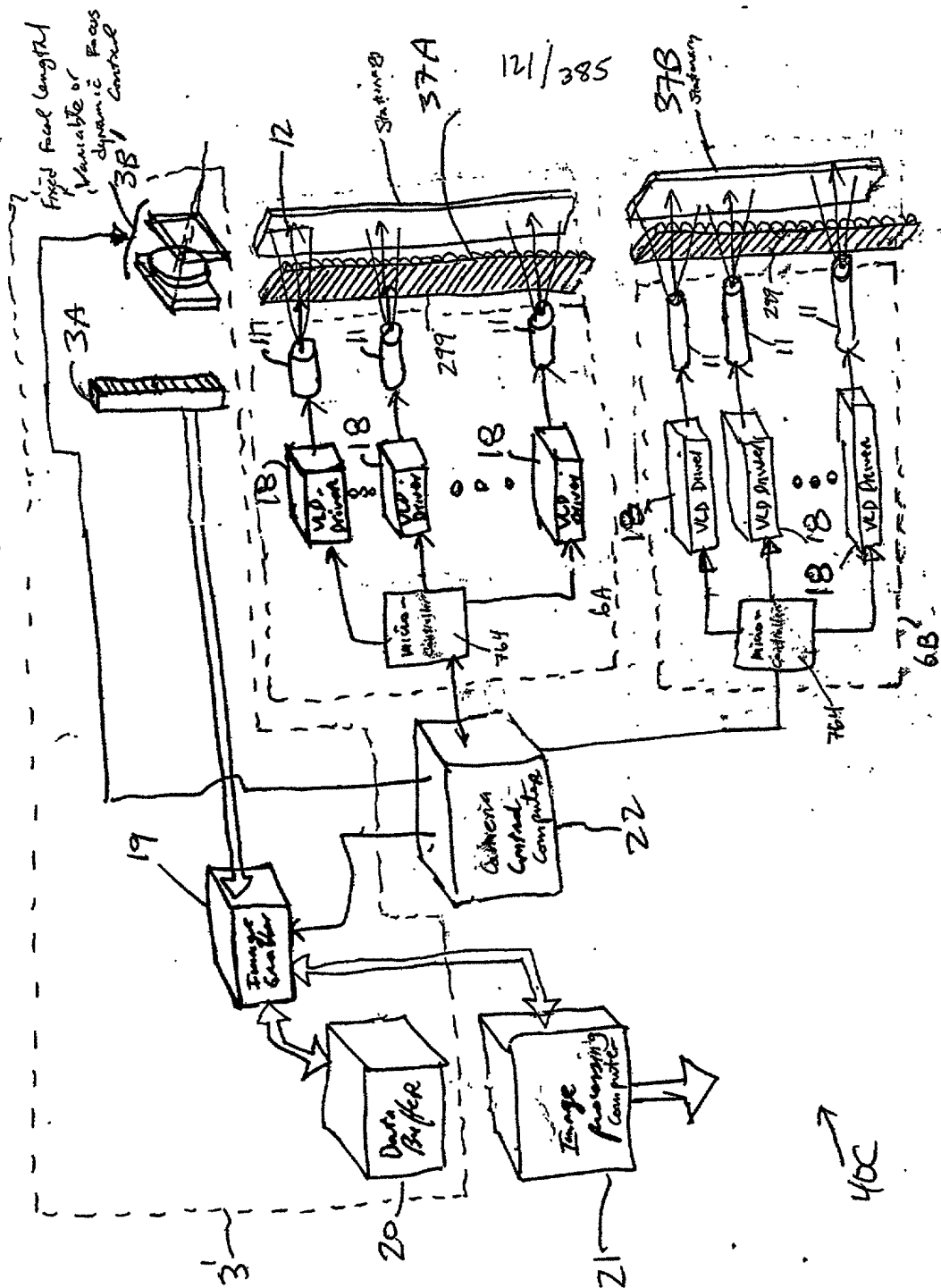


FIG. 2E2

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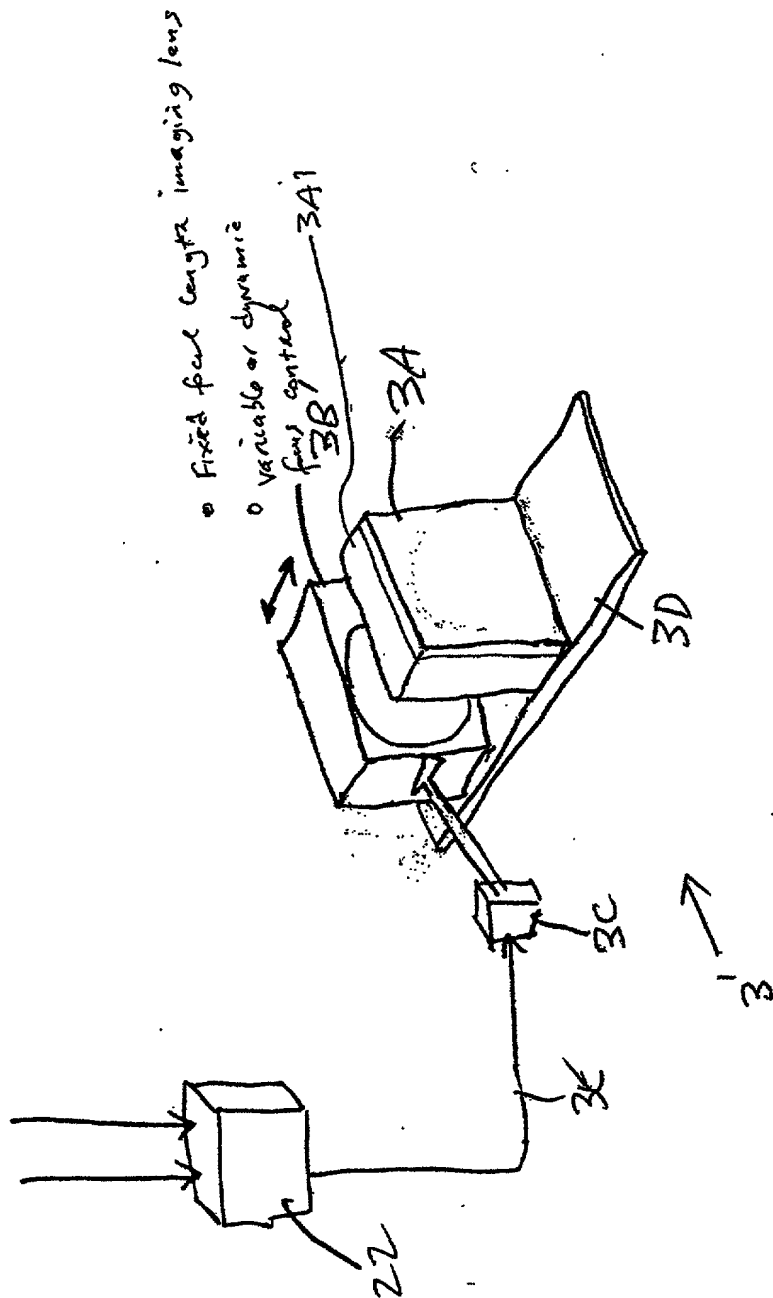


FIG. 2E3

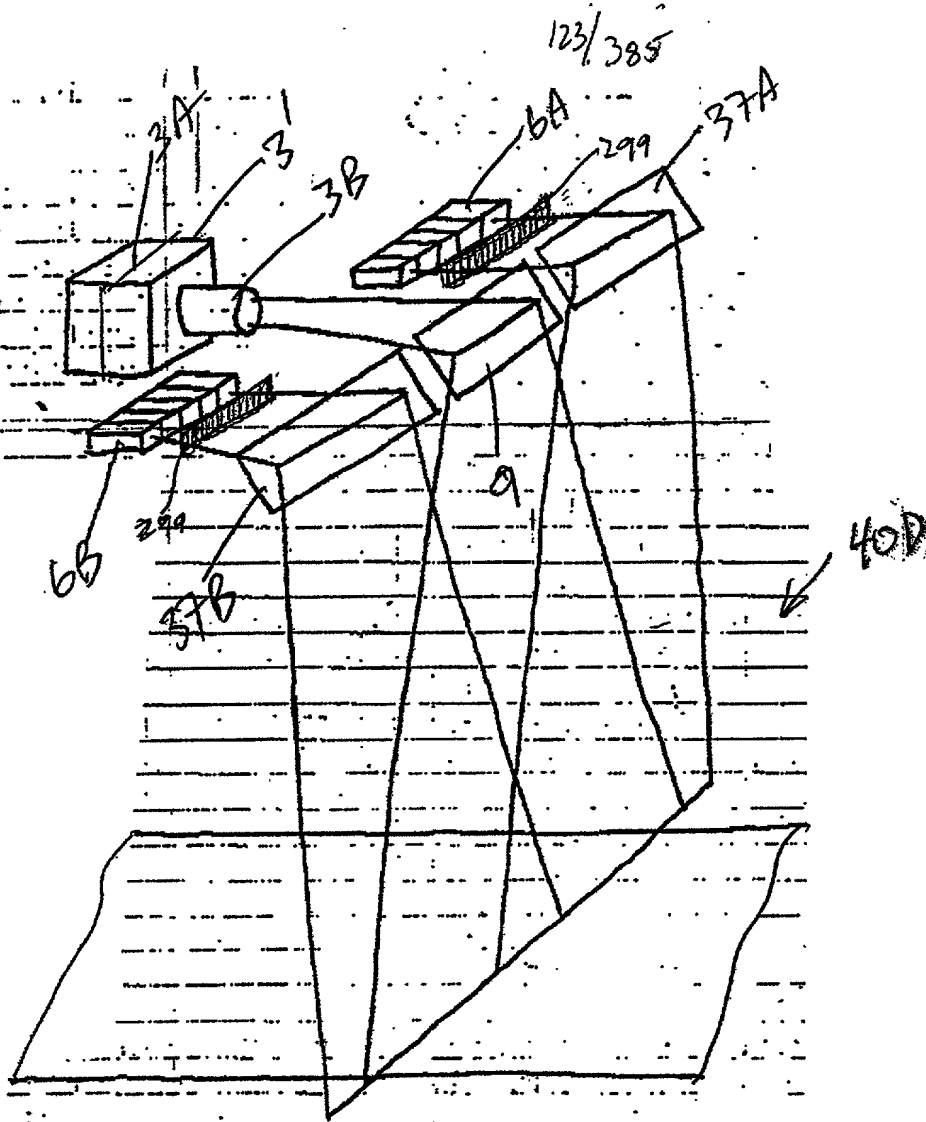


FIG. 2F1

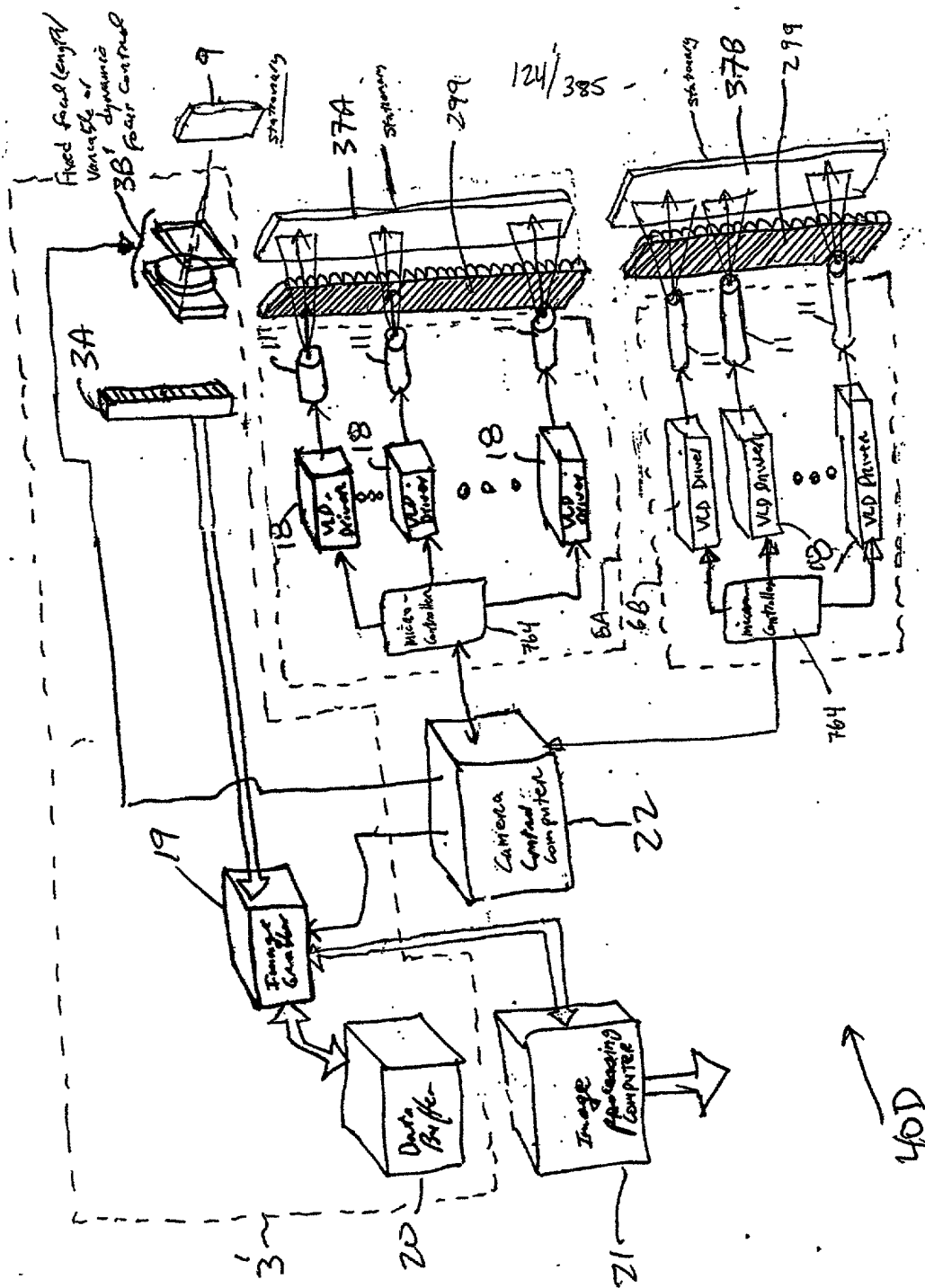


Fig 2F2



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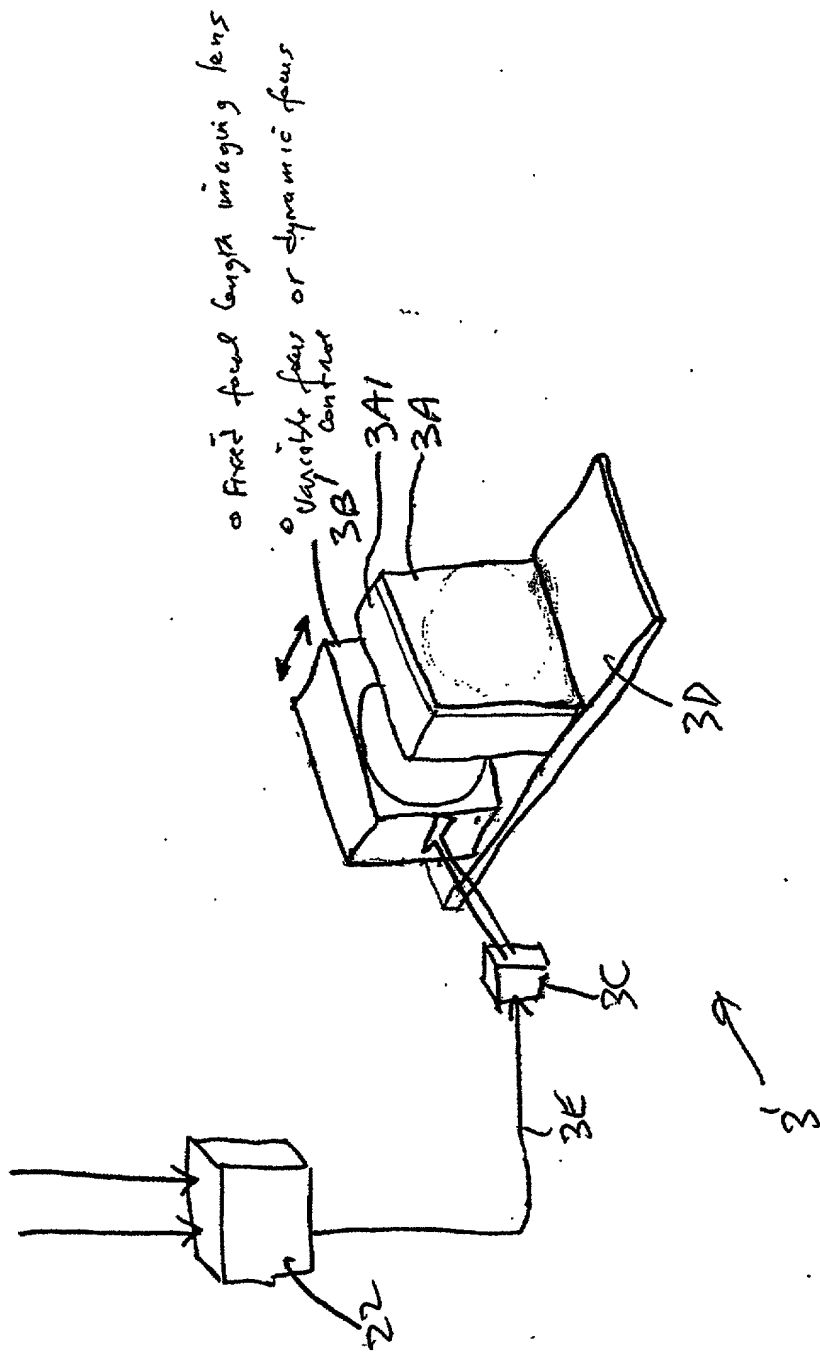


FIG. 2F3

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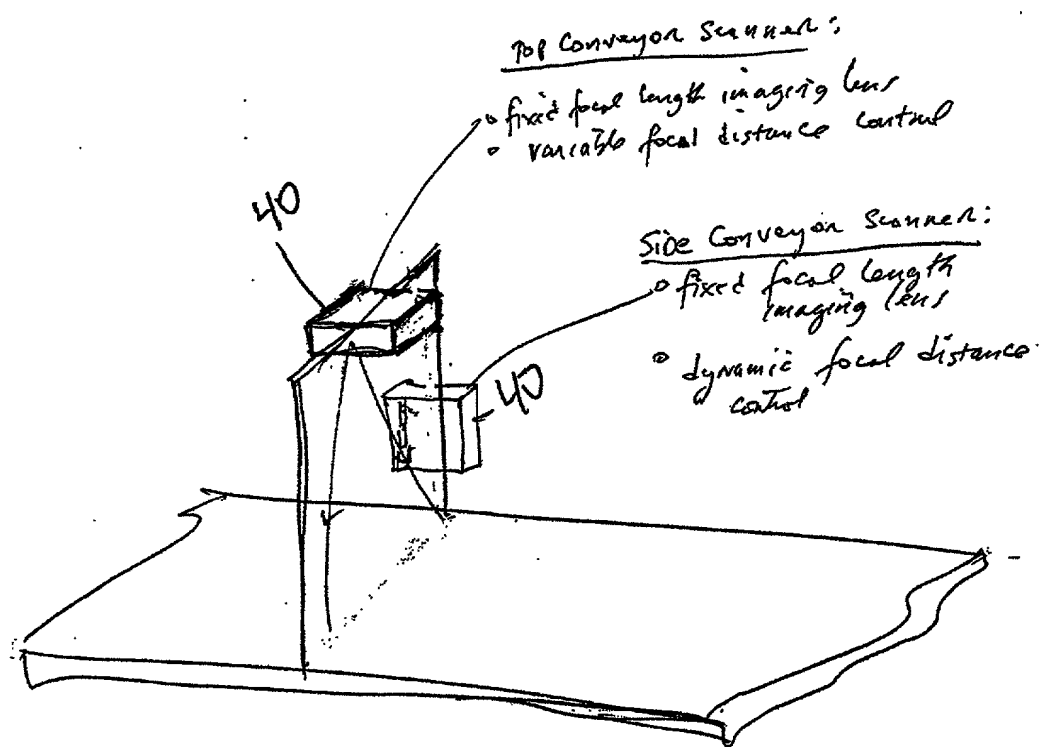
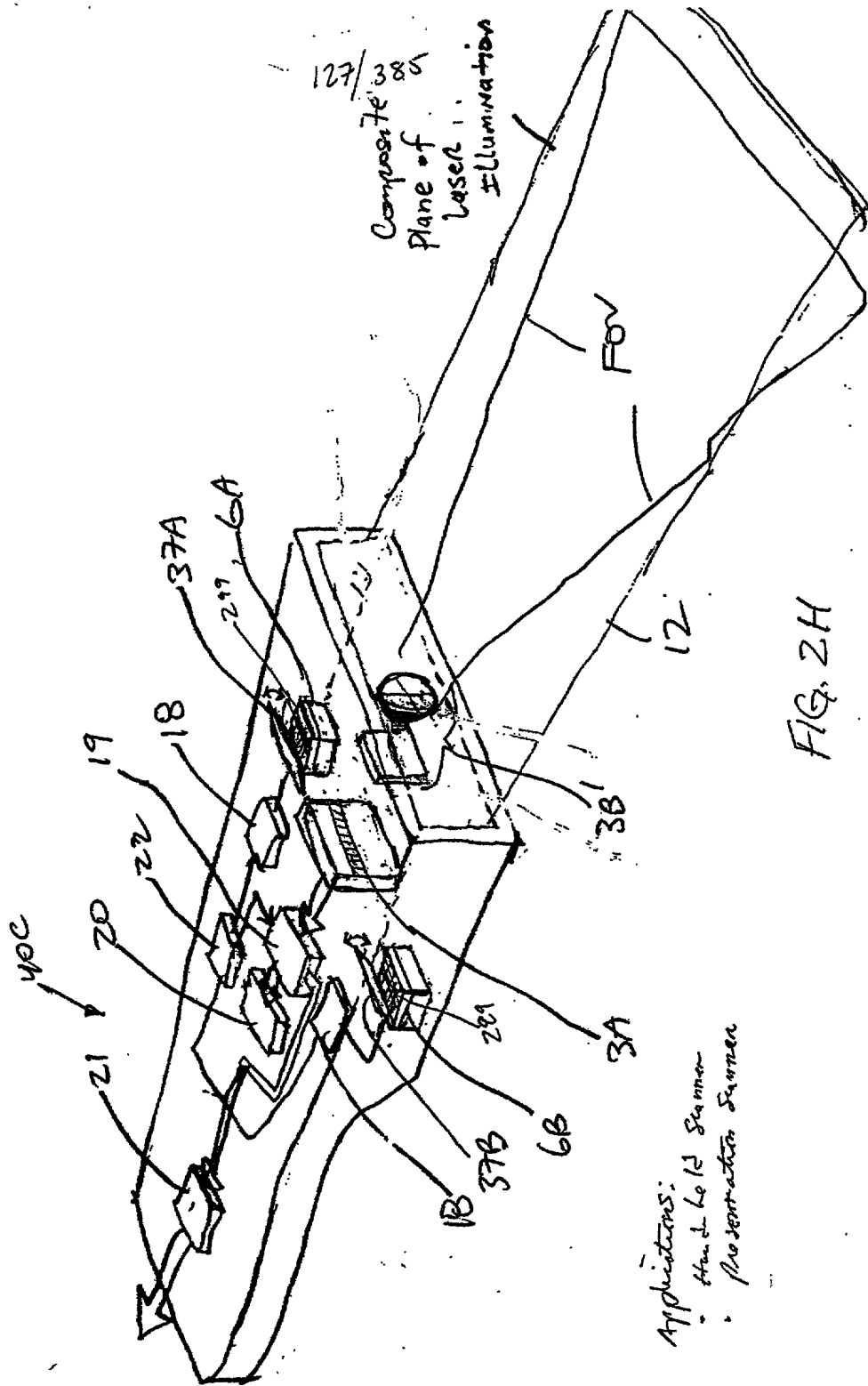


FIG. 2G



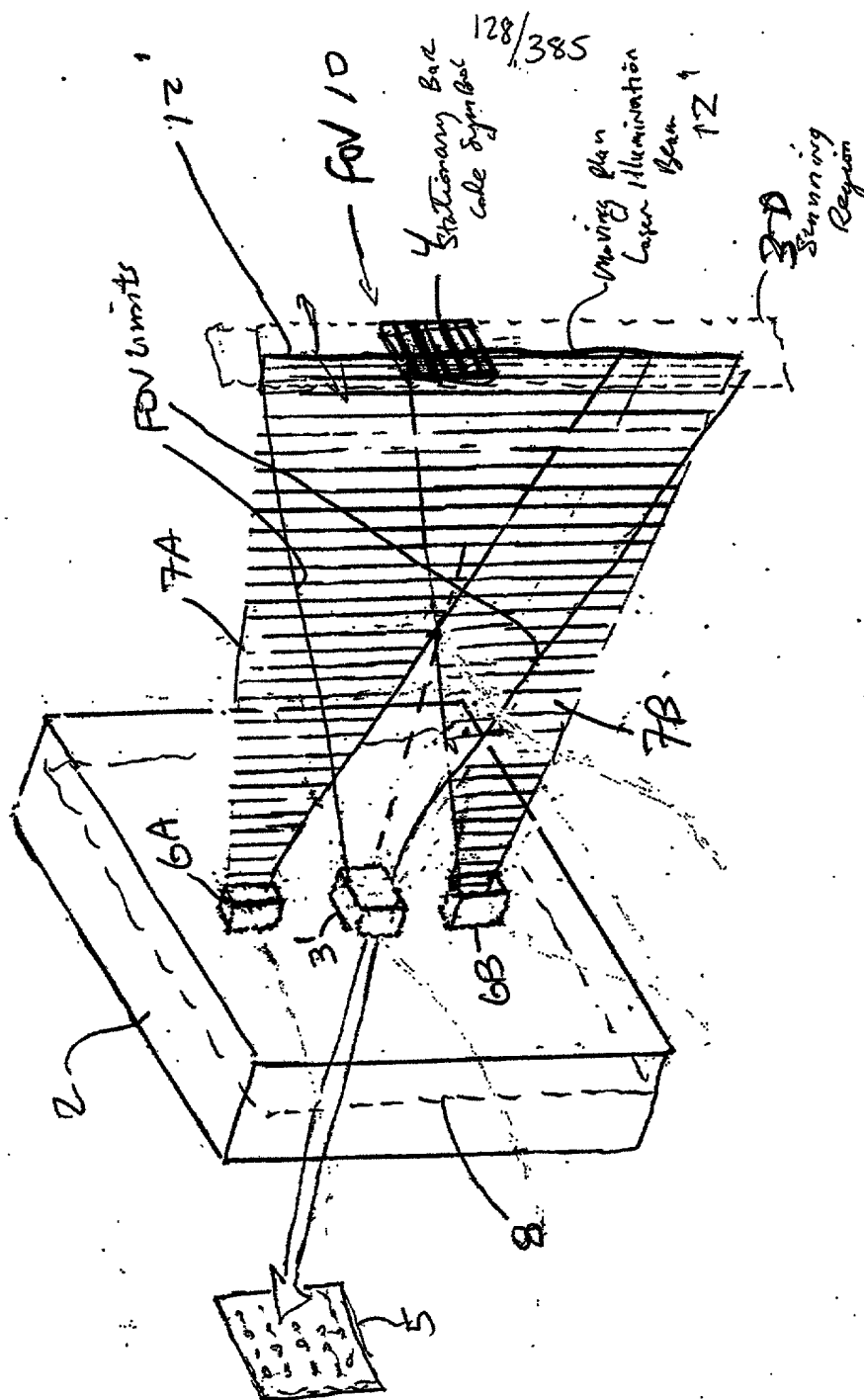
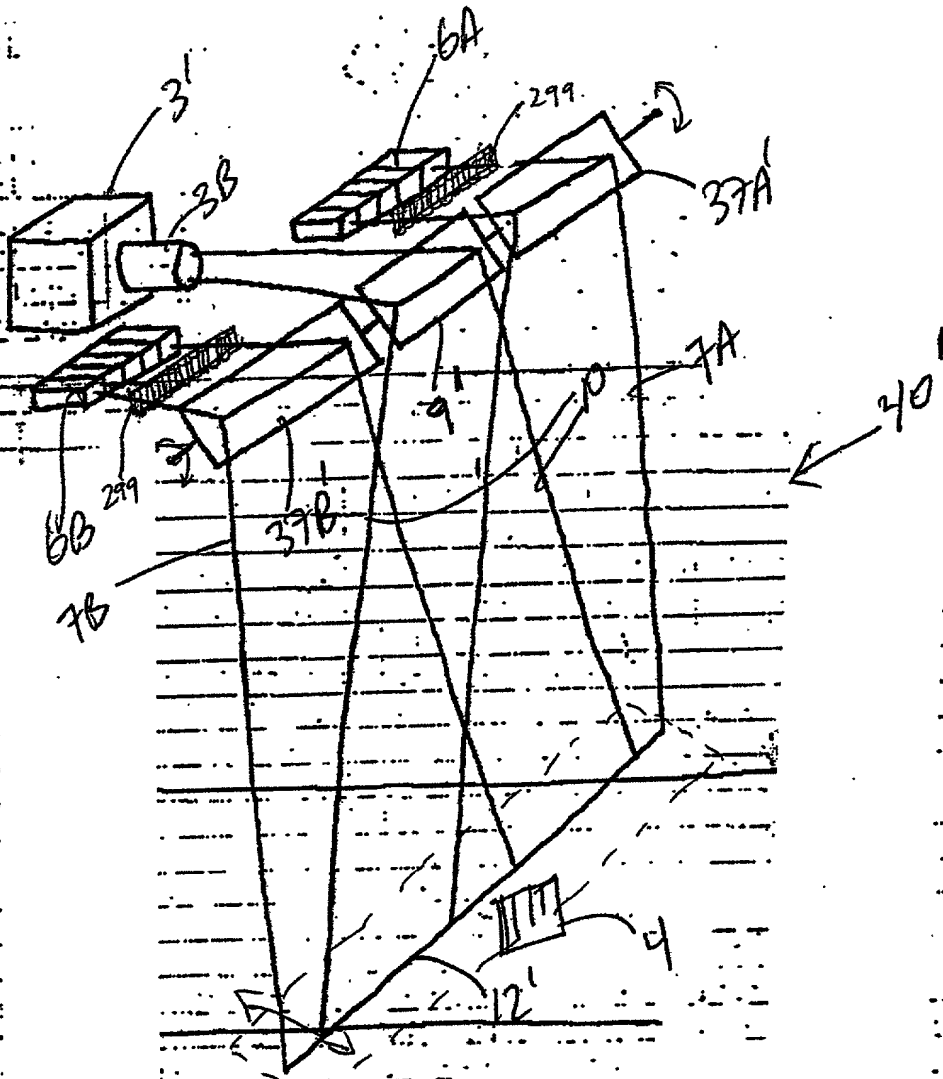


FIG. 2II

40

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3-D  
Scanning  
Region

FIG 2I2

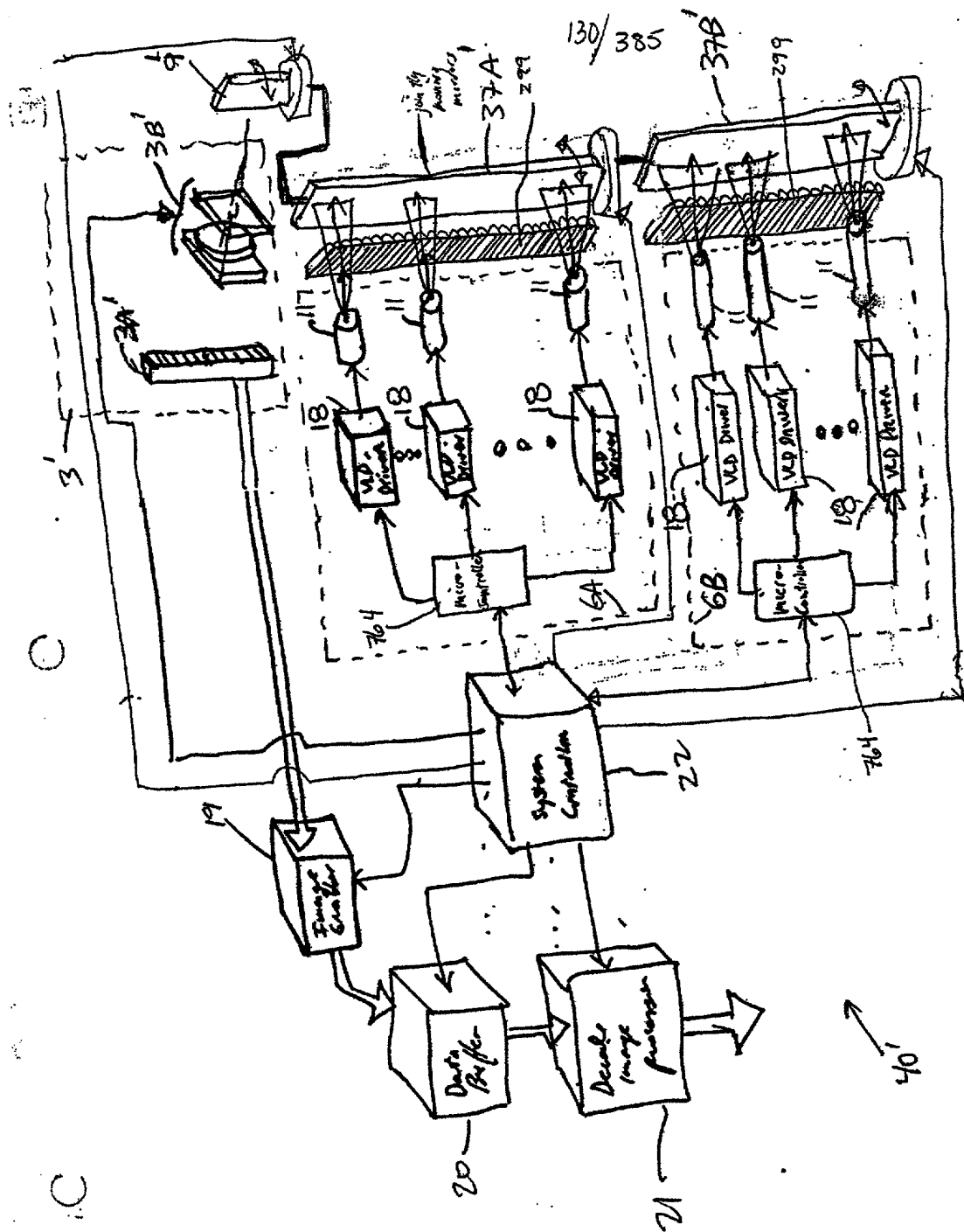


FIG. 2I3

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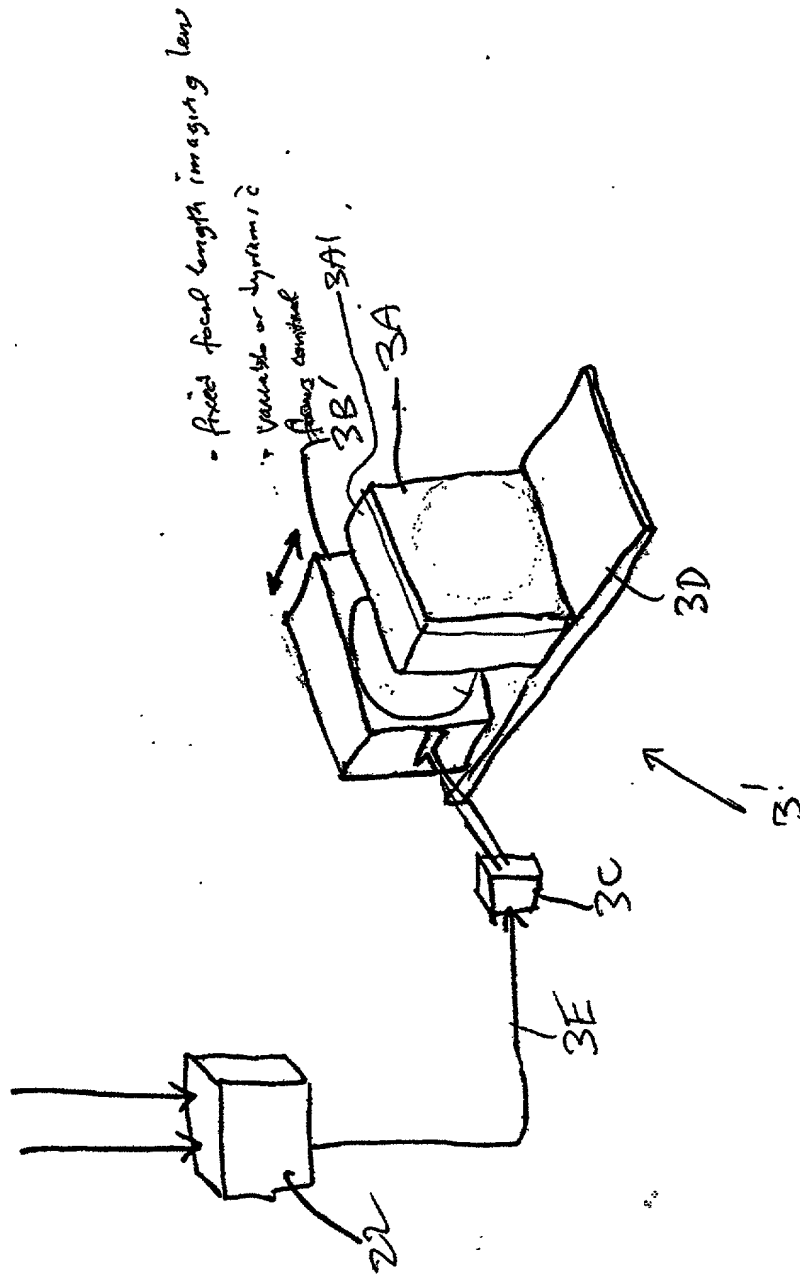


FIG. 2I4

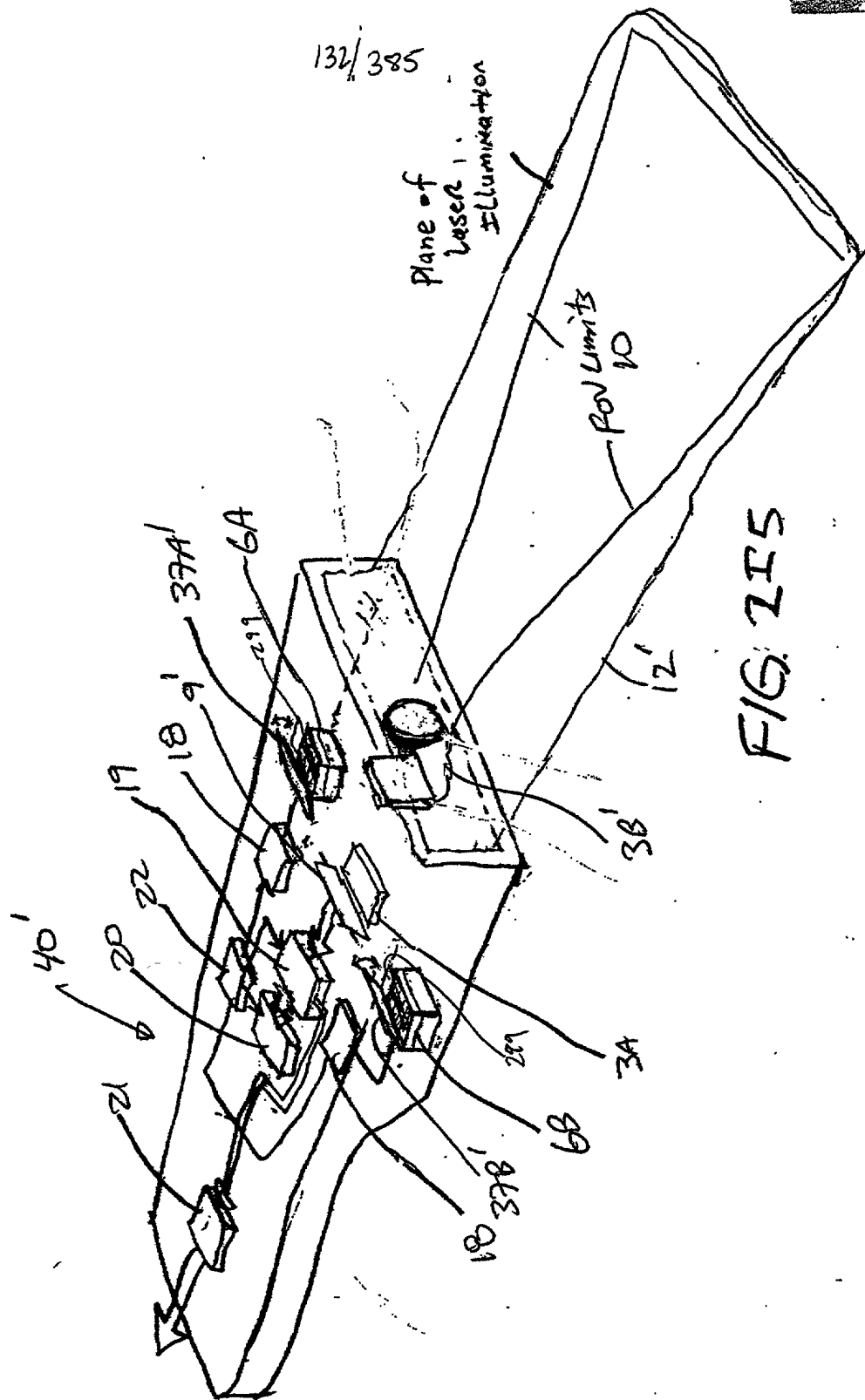


FIG. 215



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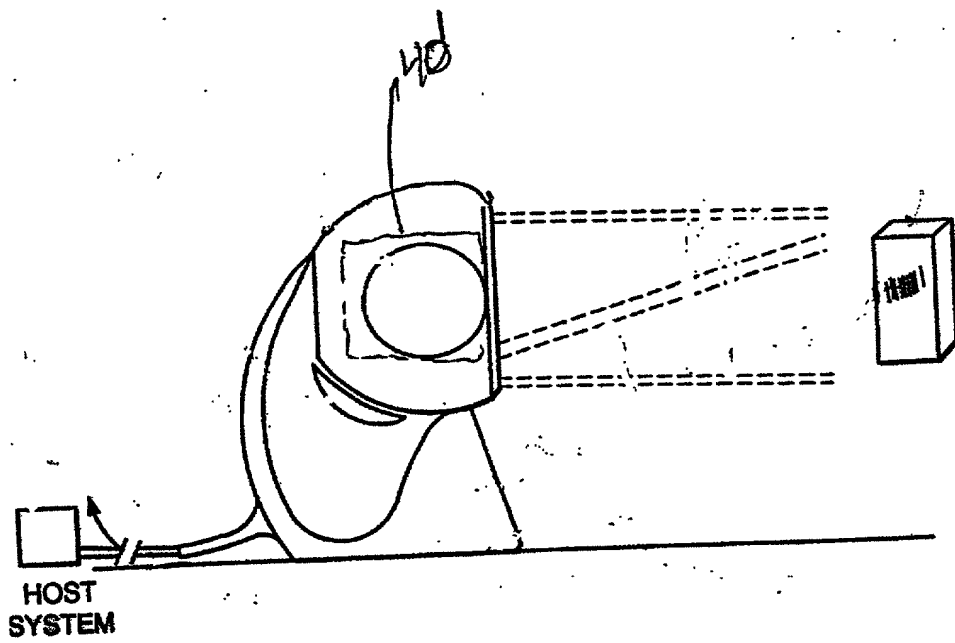


FIG. 2I6

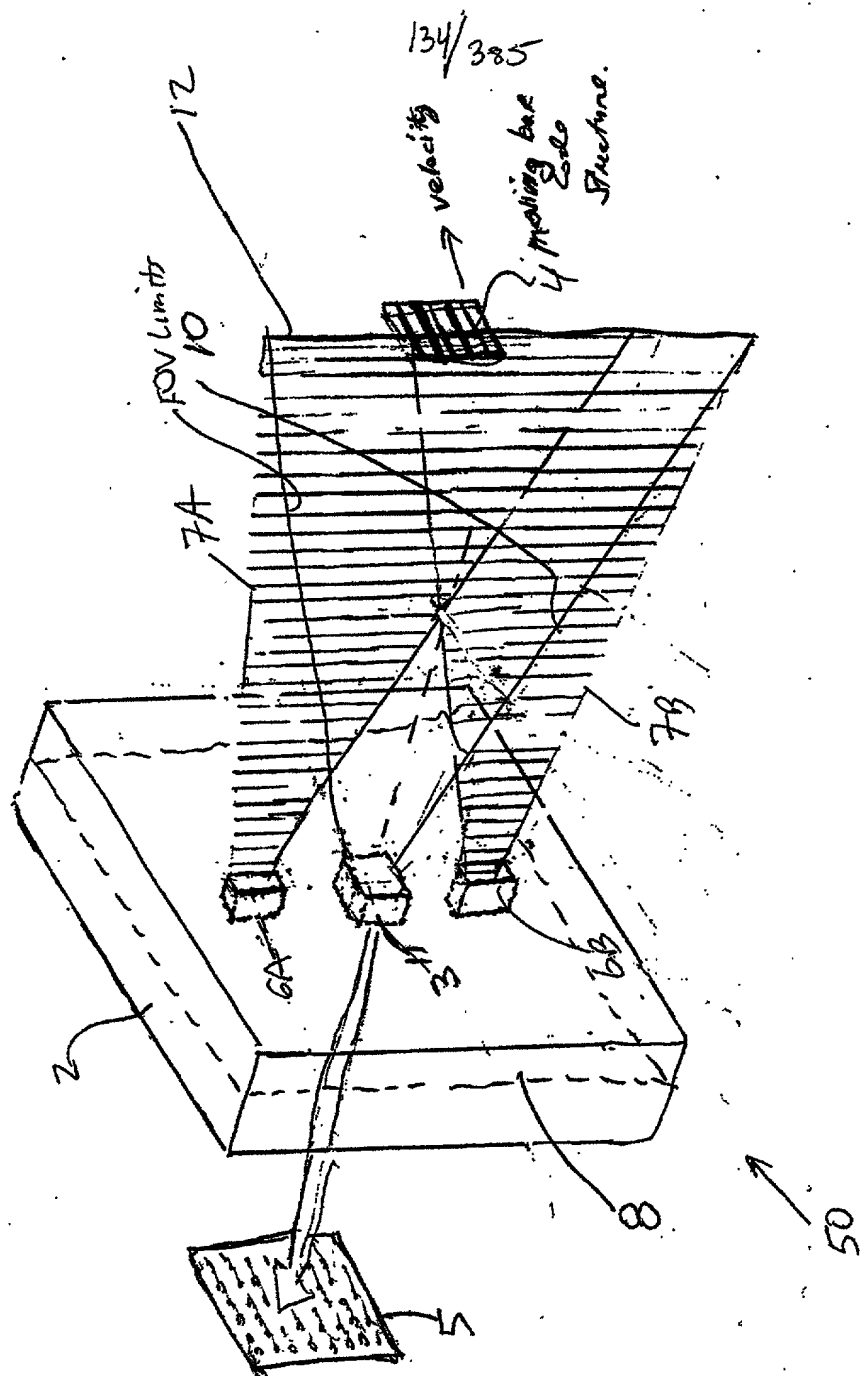


FIG. 3A

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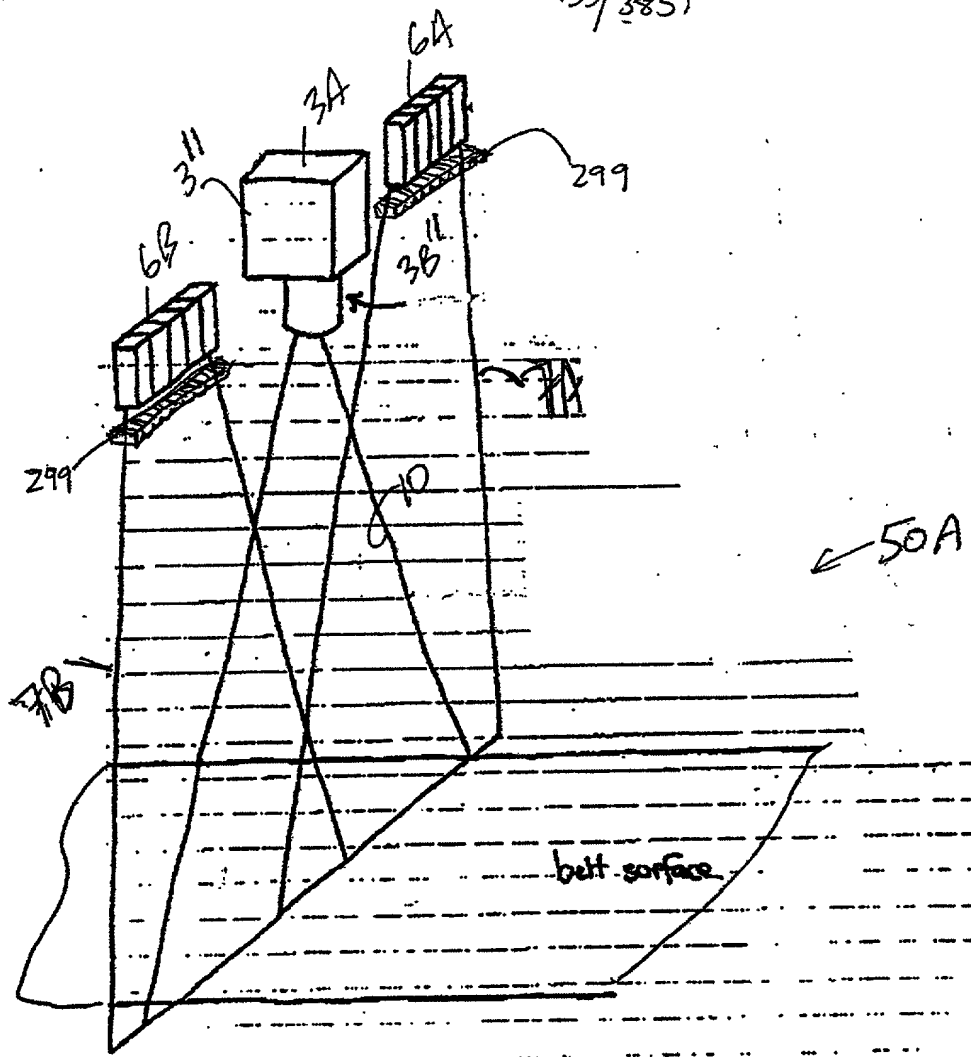


FIG. 3B1

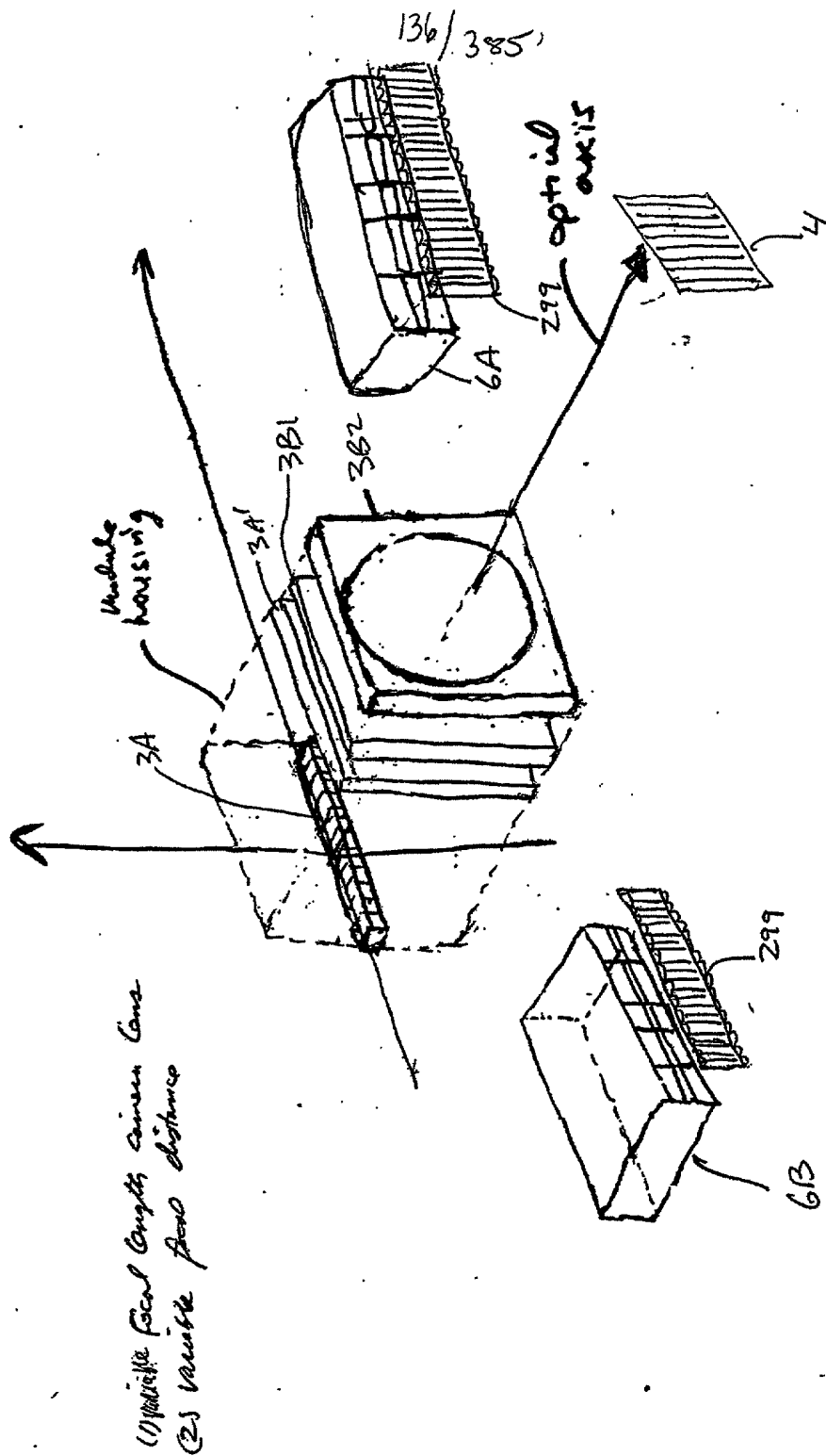
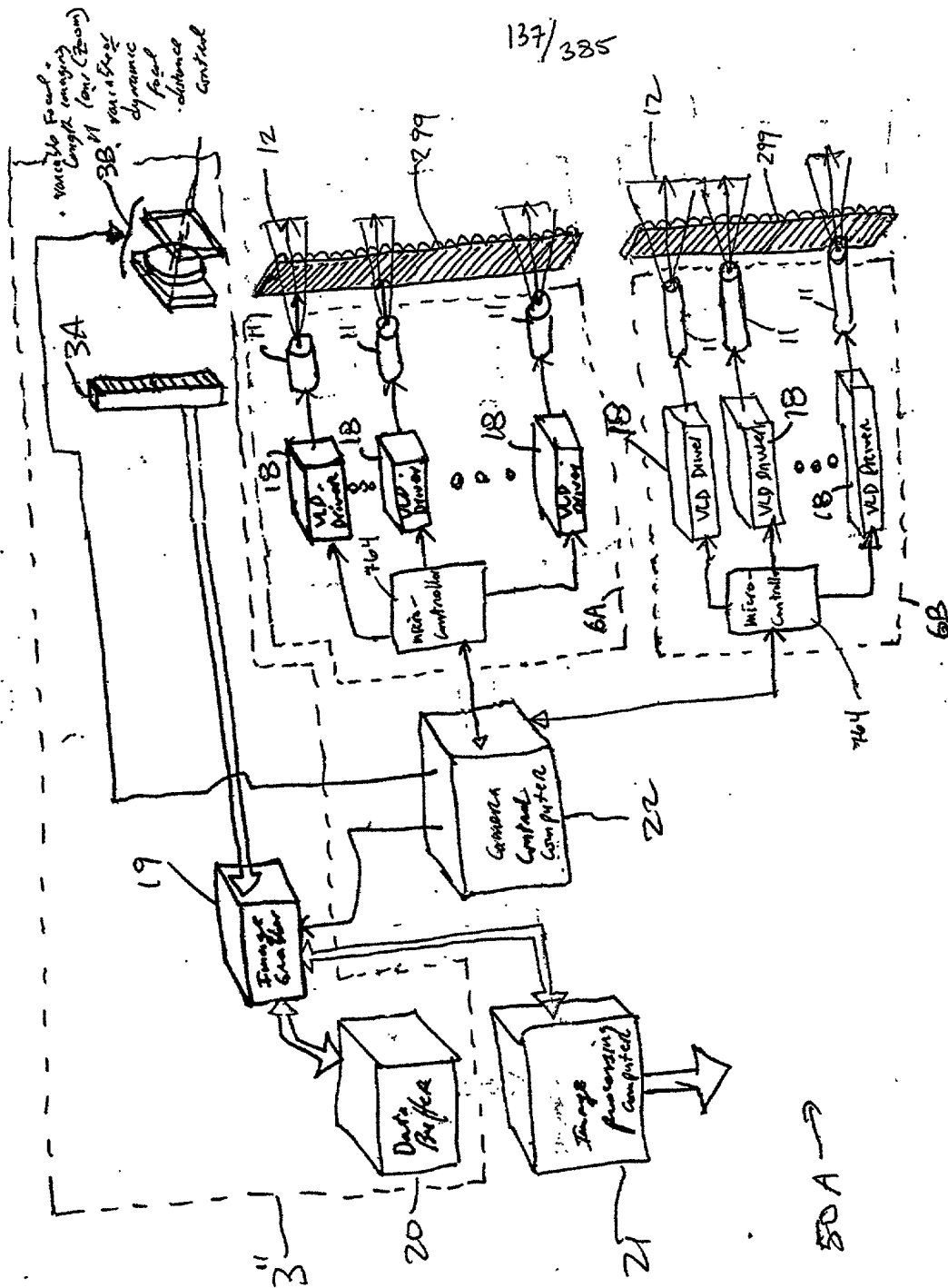
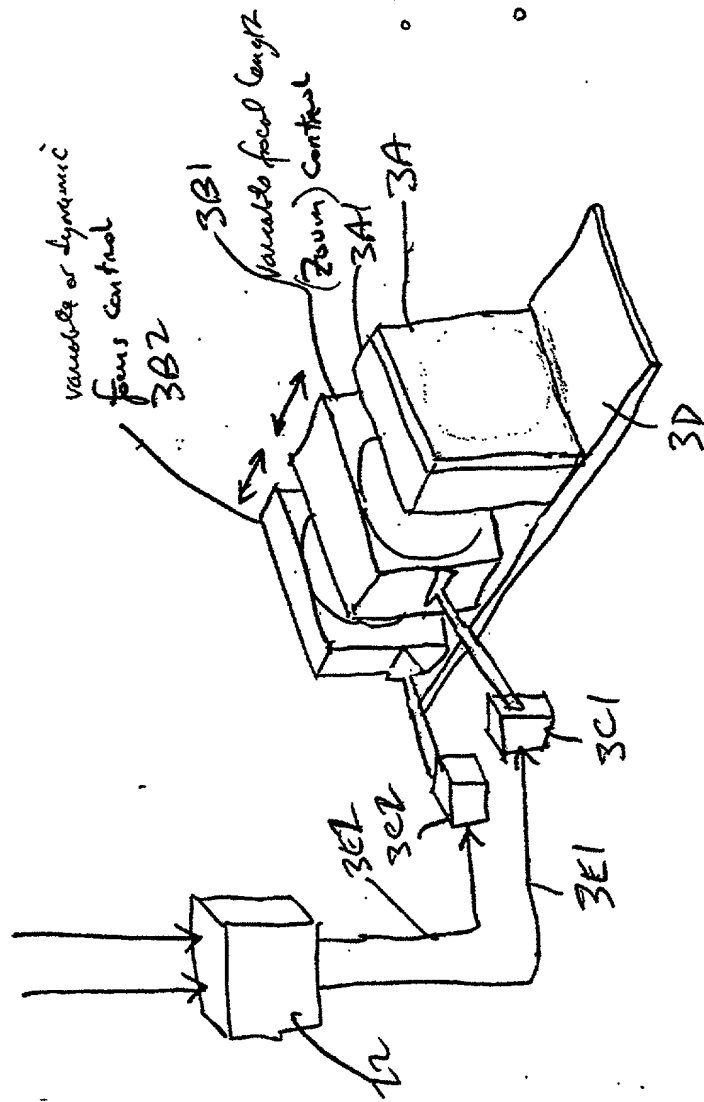


FIG. 3B2

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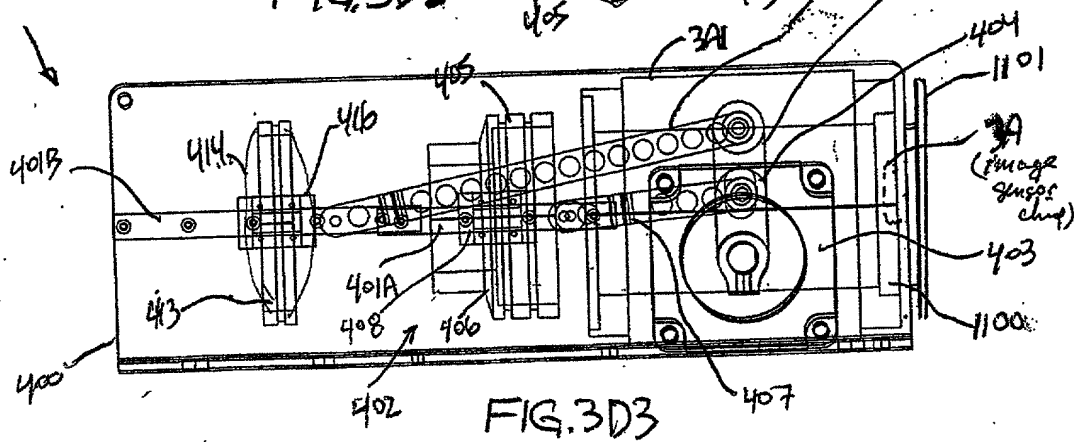
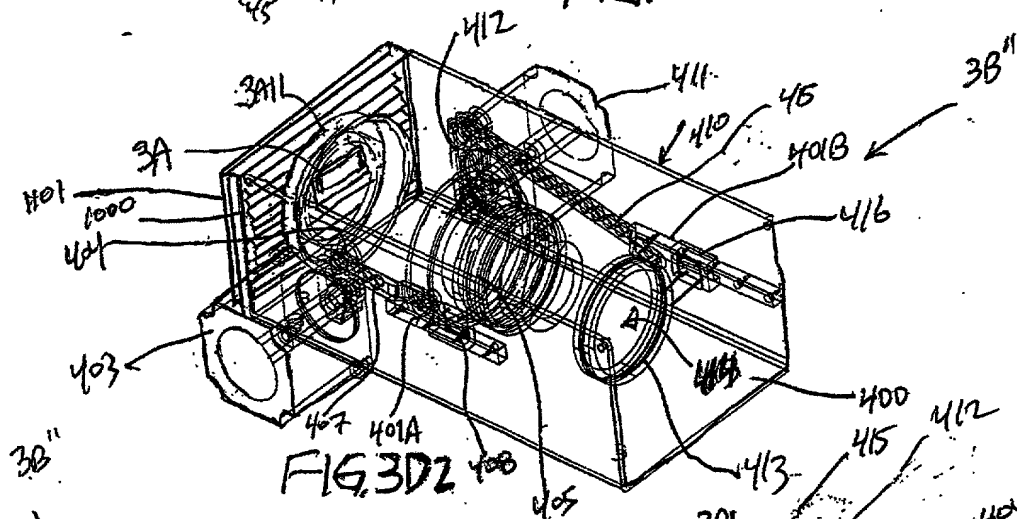
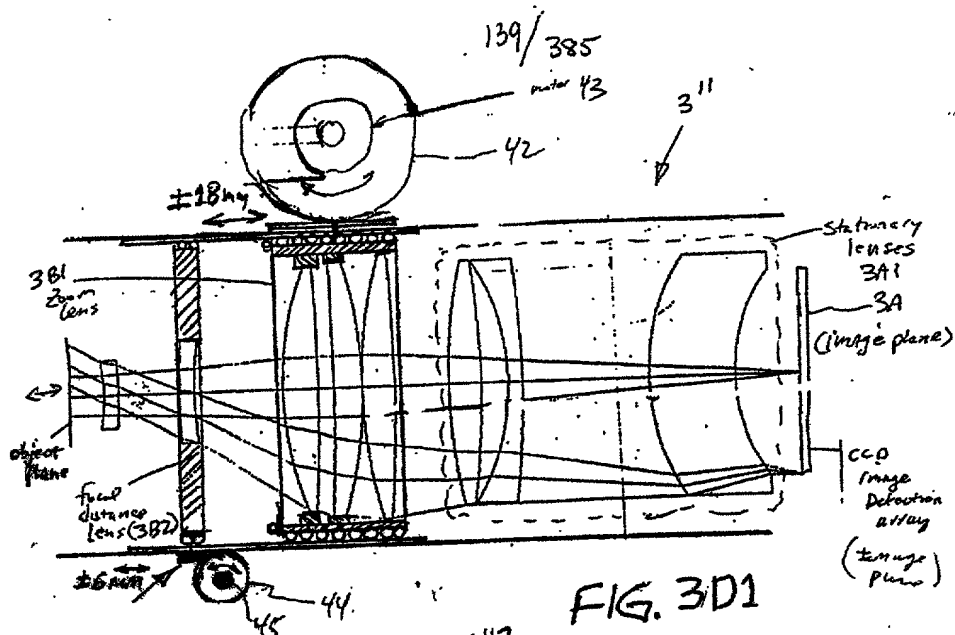
50 A ↑

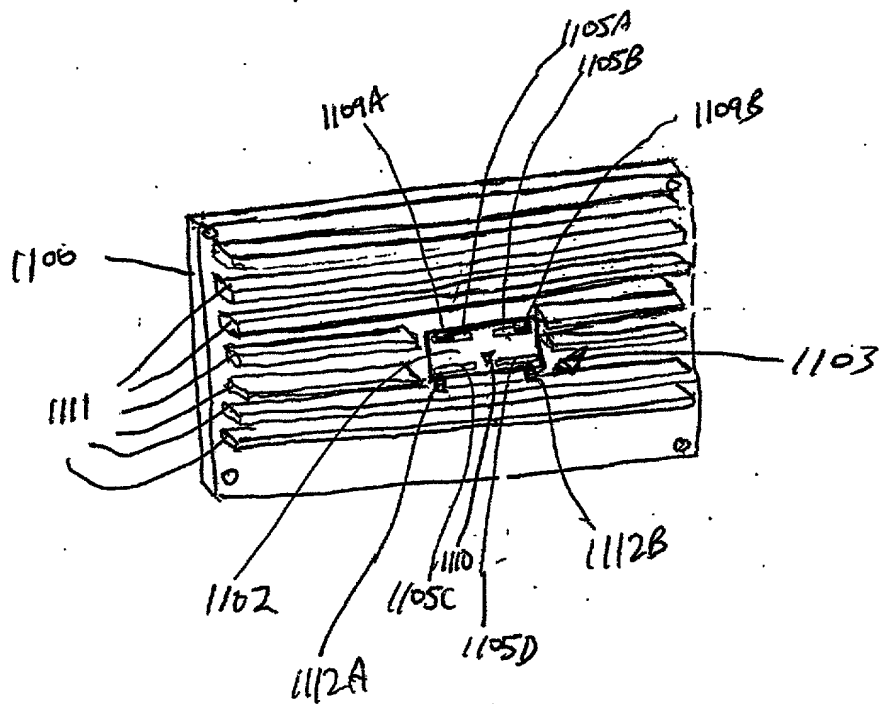
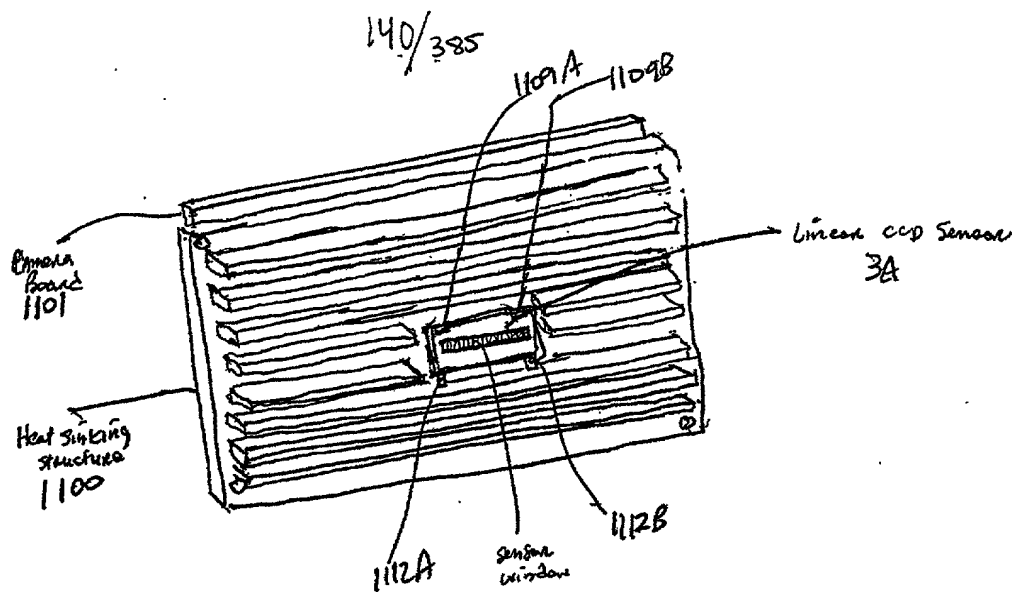


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- Variable focal length camera lens
- Variable focal distance

FIG. 3CZ







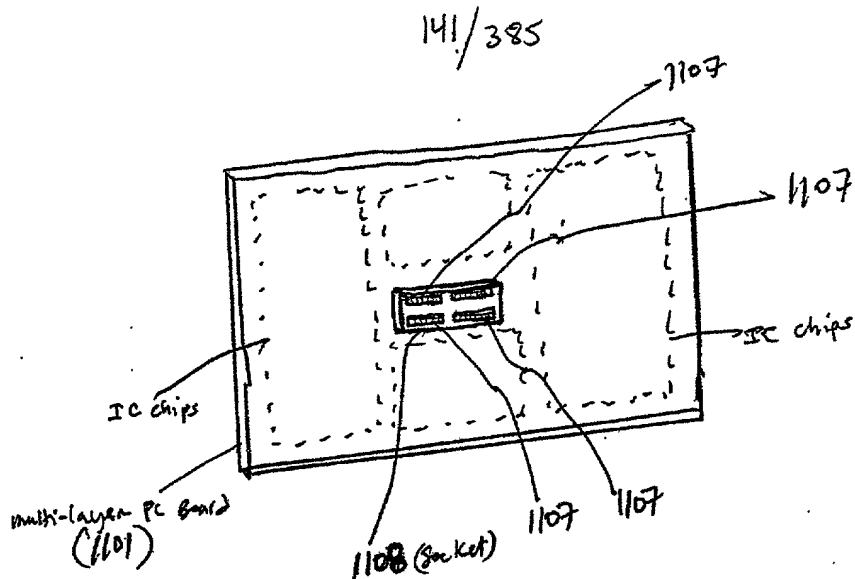


FIG. 3D6

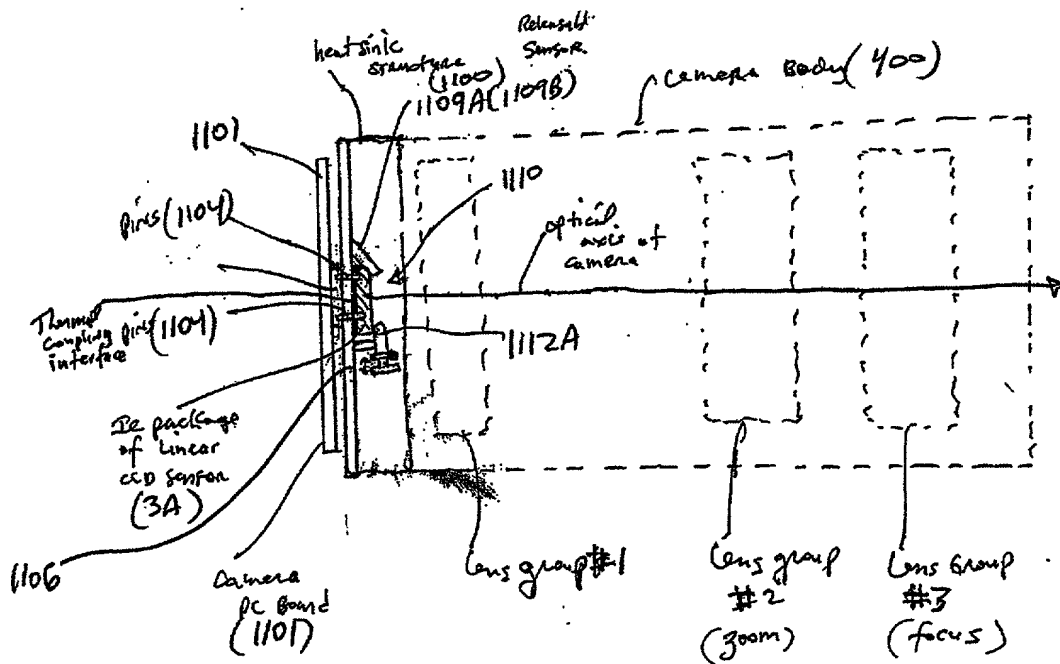
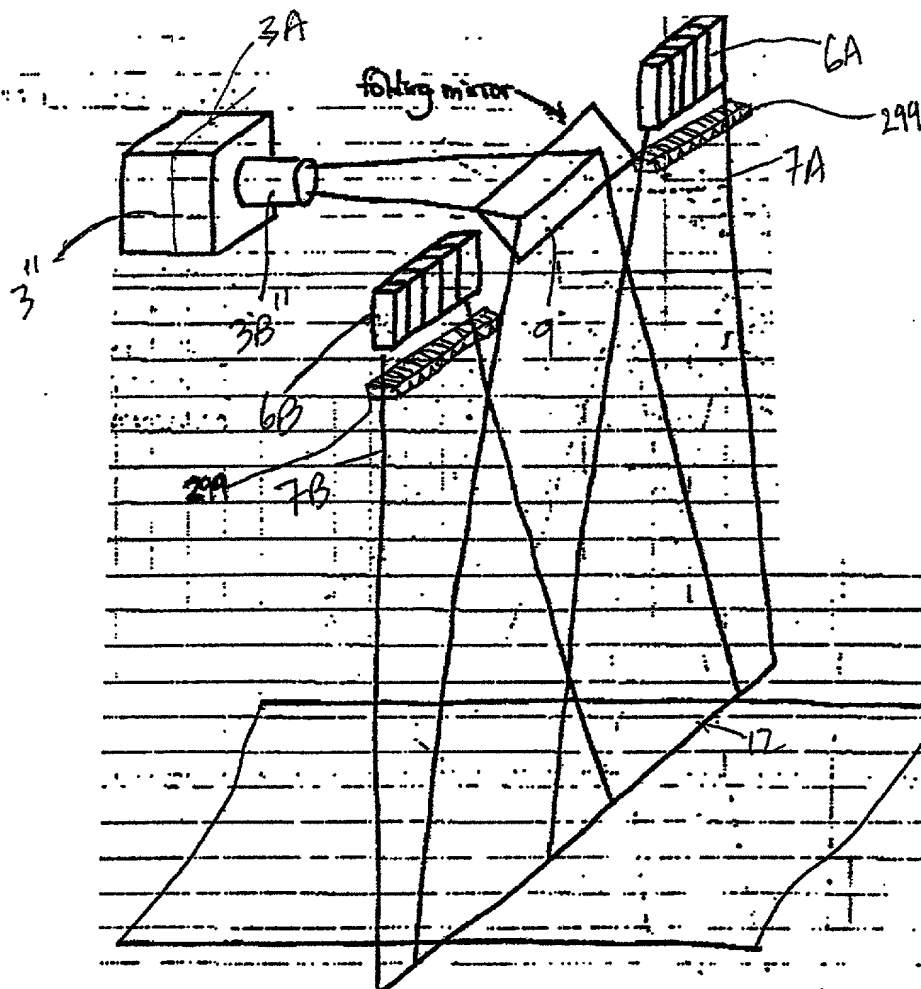


FIG. 3D7

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FIG. 3E1

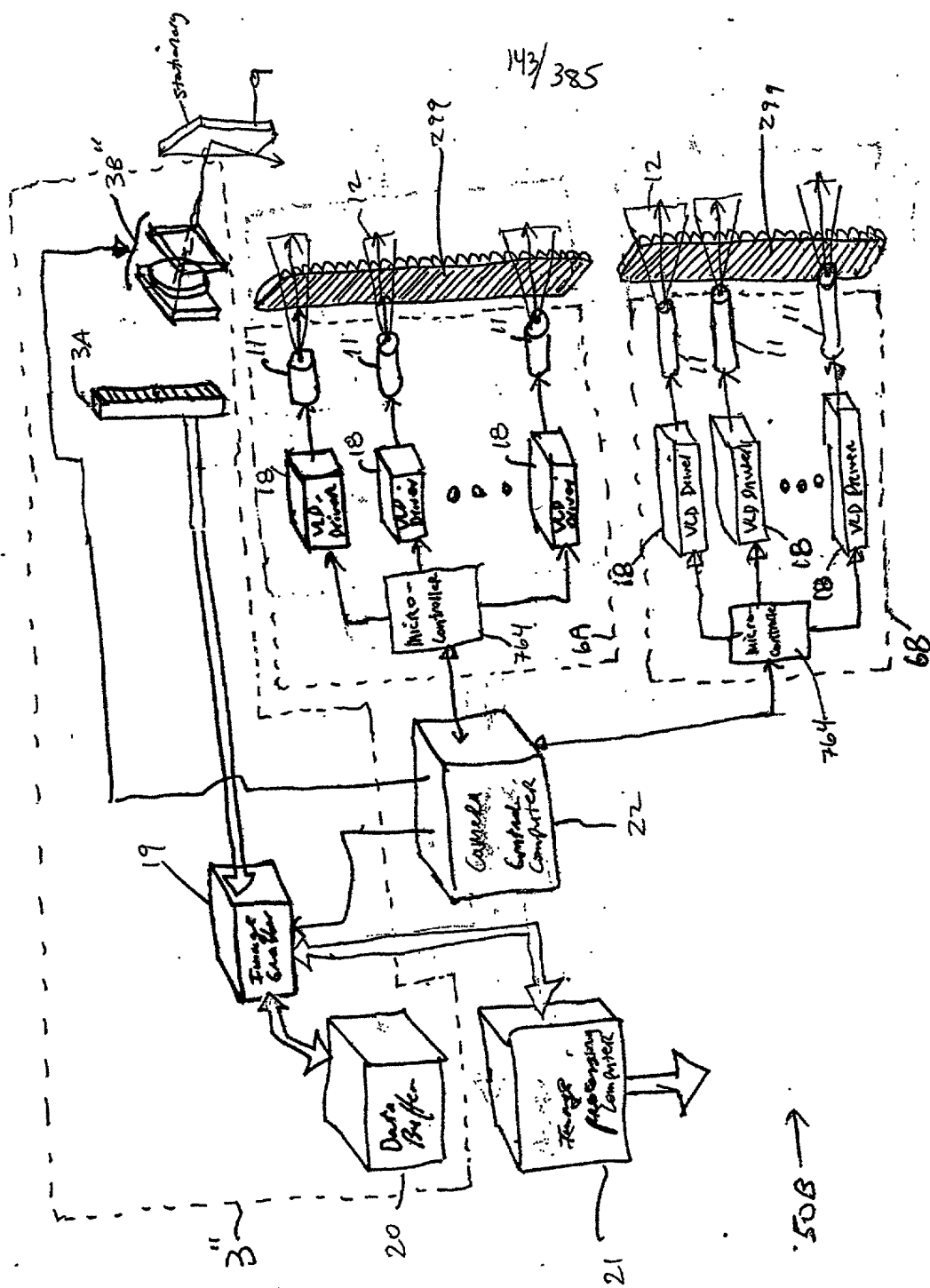


FIG. 3E2

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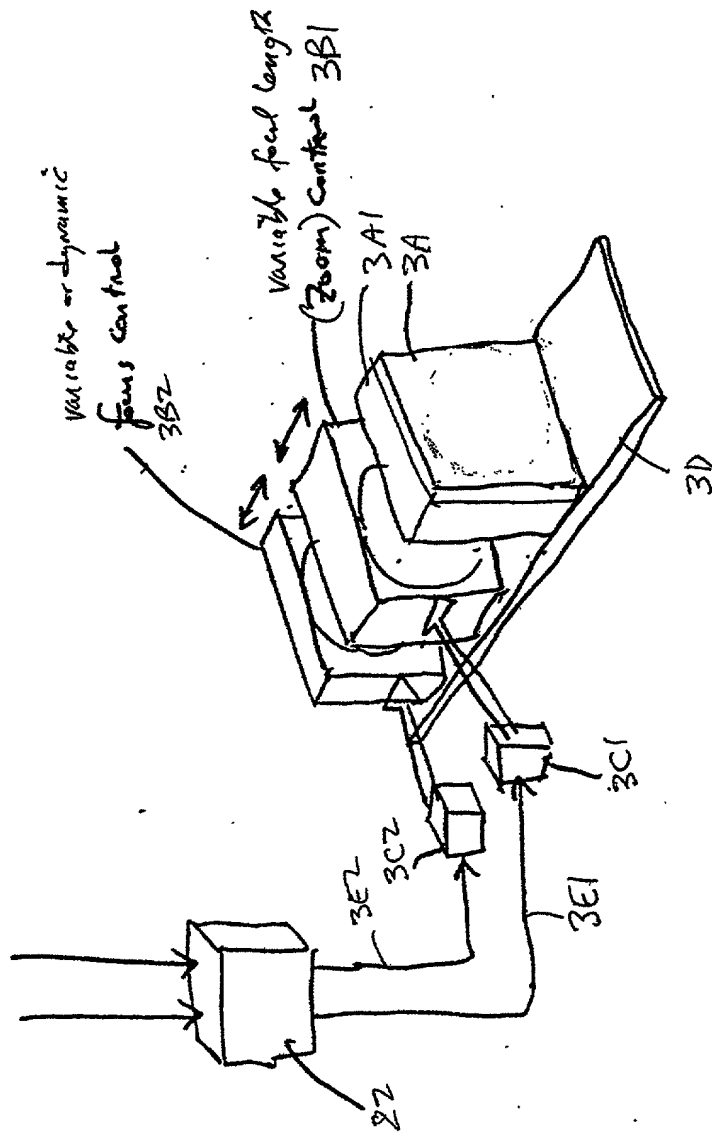
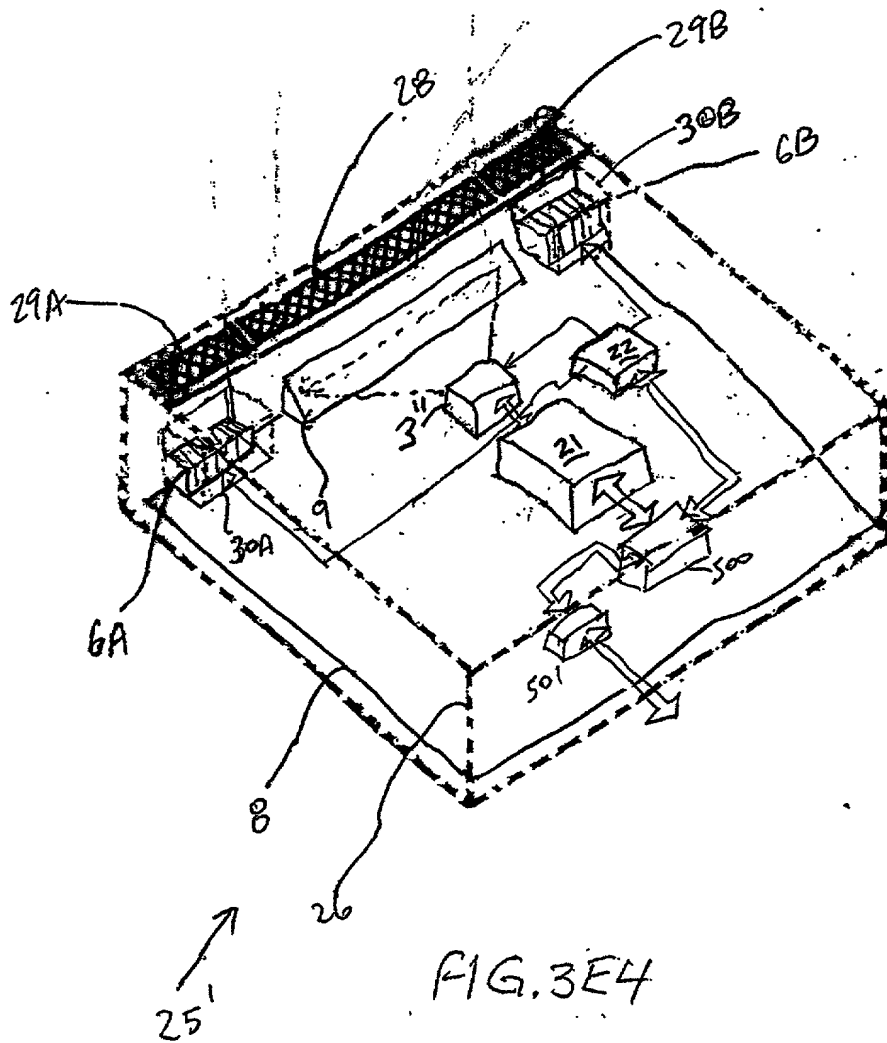


FIG. 3E3

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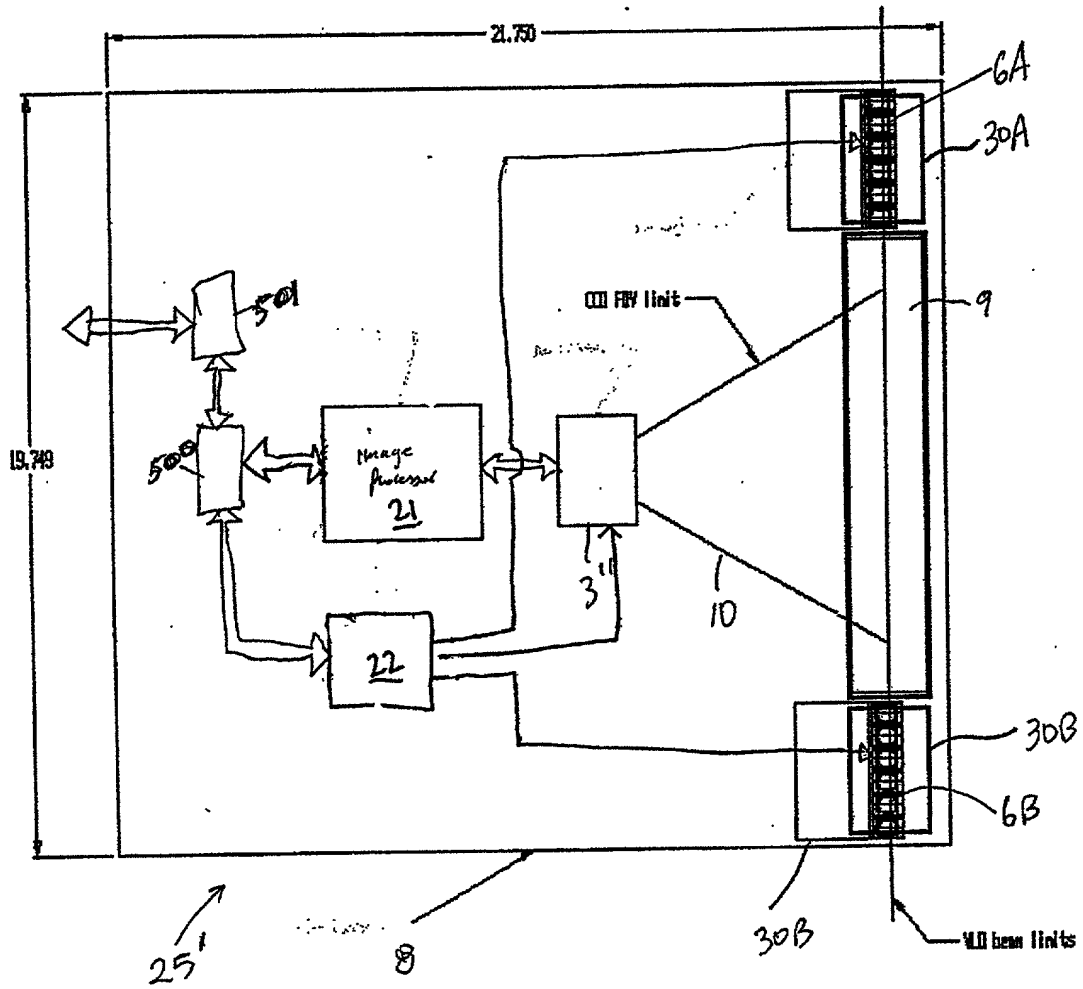


FIG. 3E5

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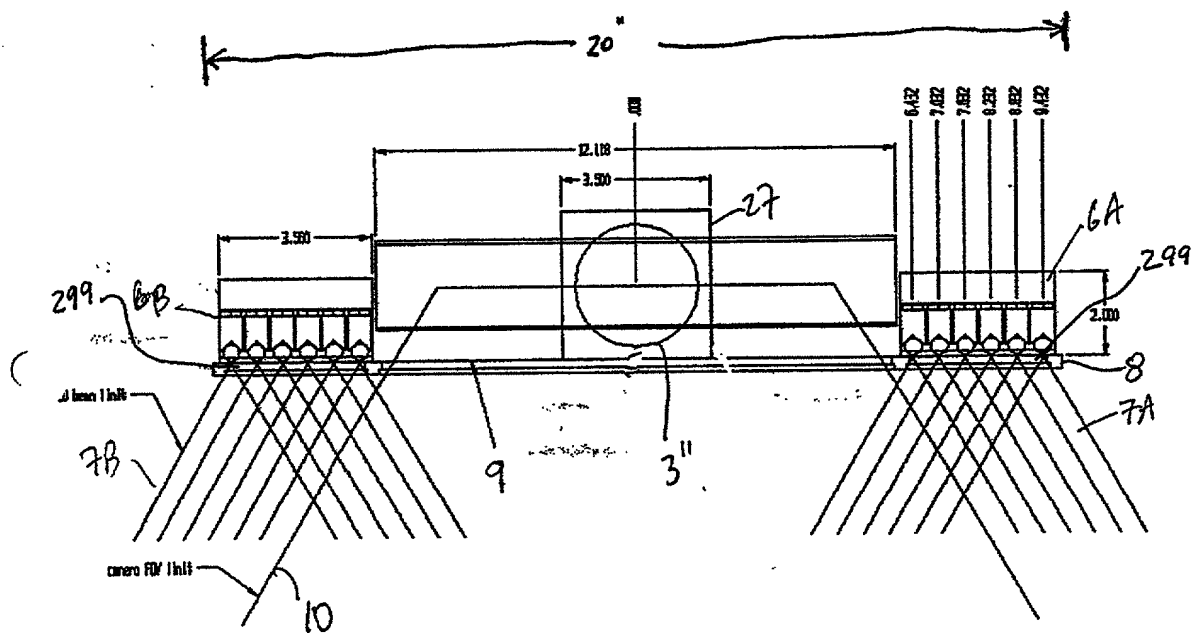


FIG. 3E6

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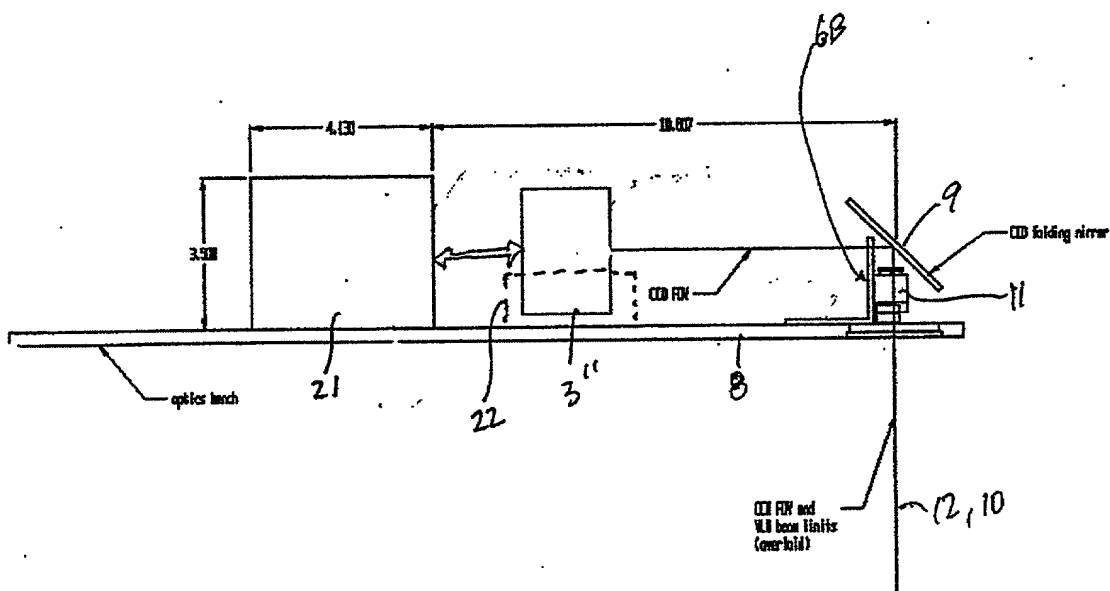


FIG. 3E7



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\*Variable FOV

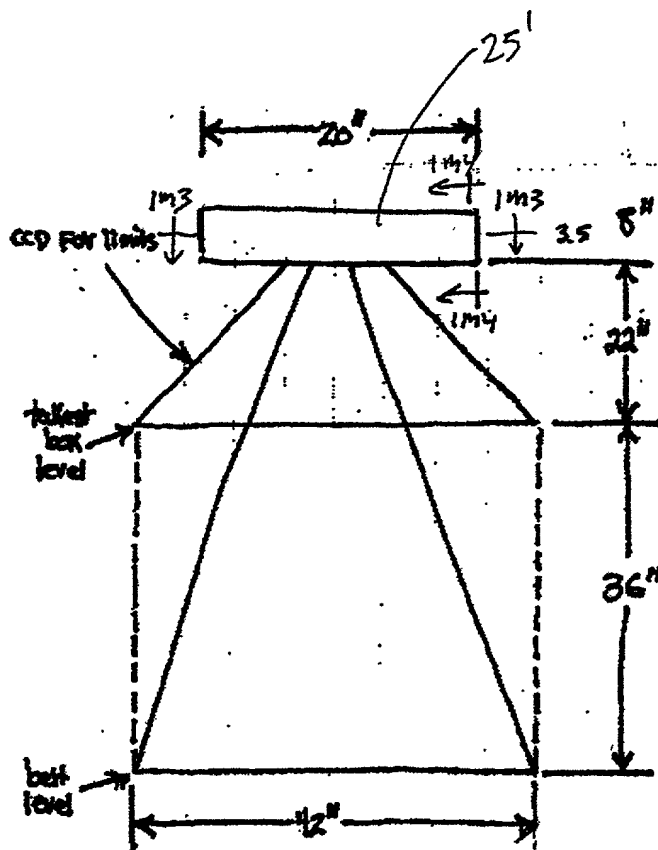


FIG. 3E8

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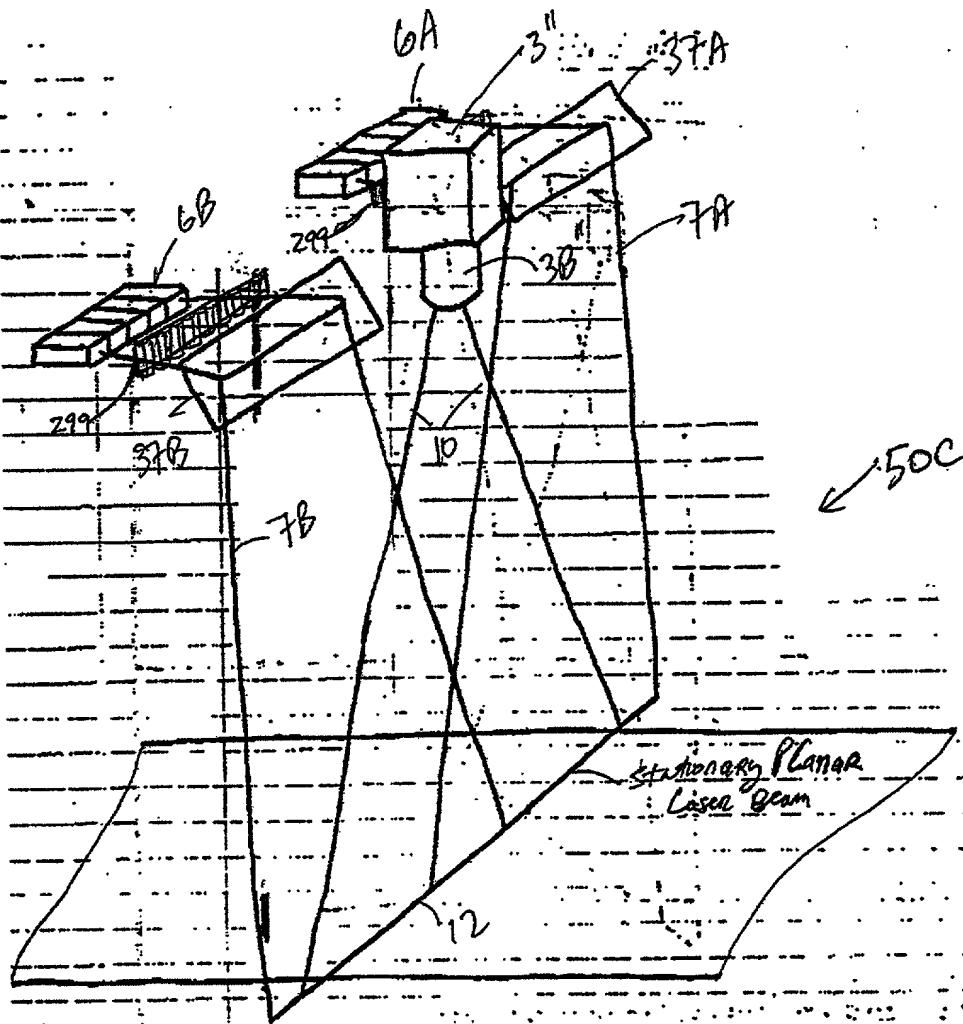


FIG. 3F1

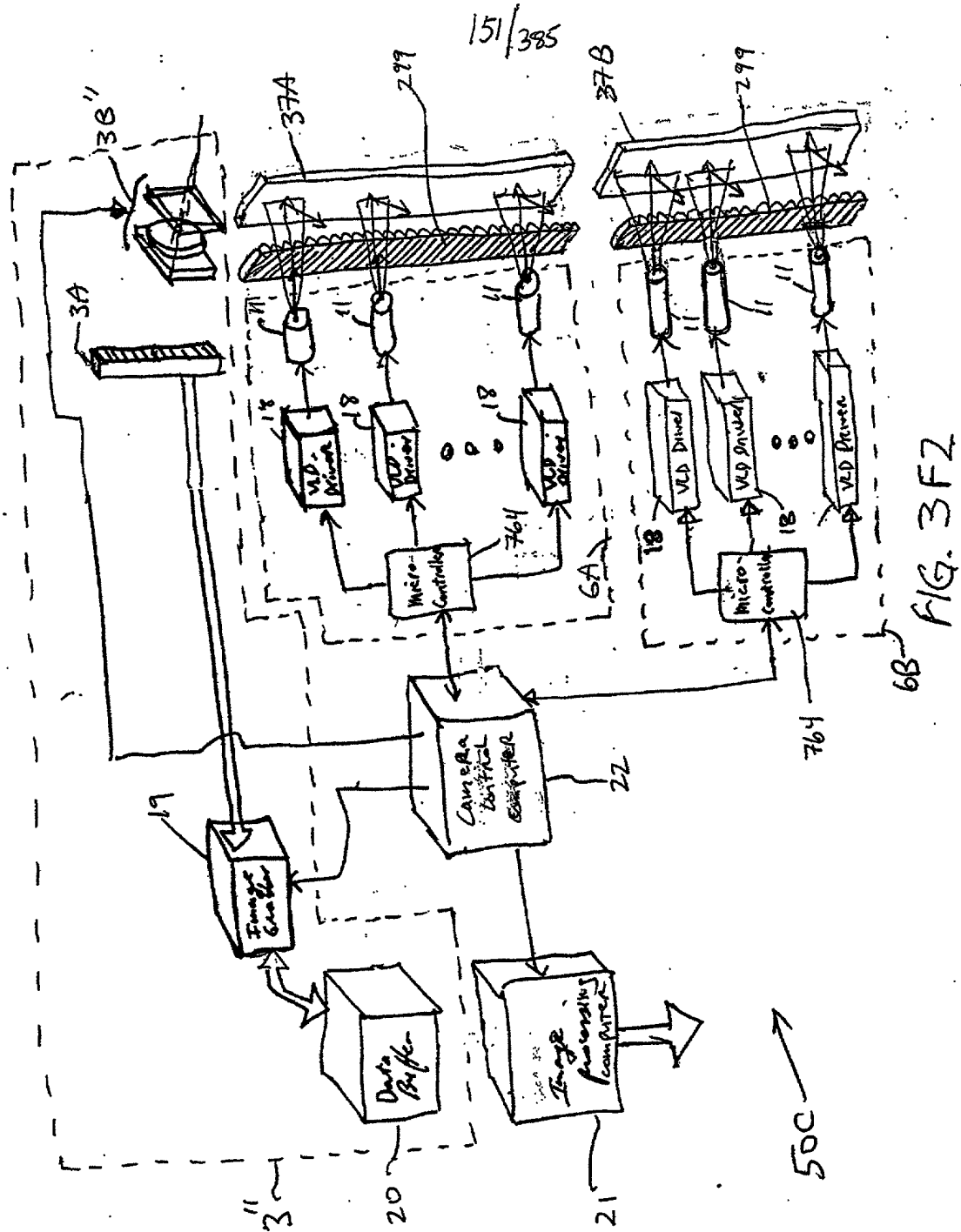


FIG. 3F2

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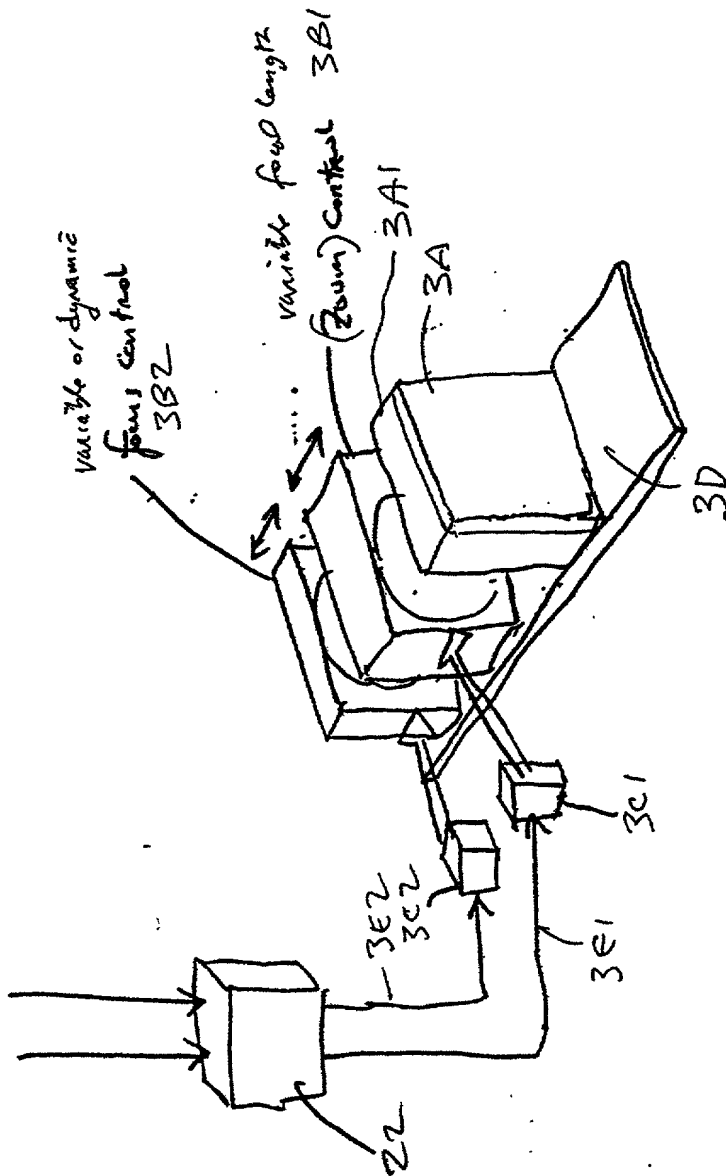


FIG. 3F3

3" →

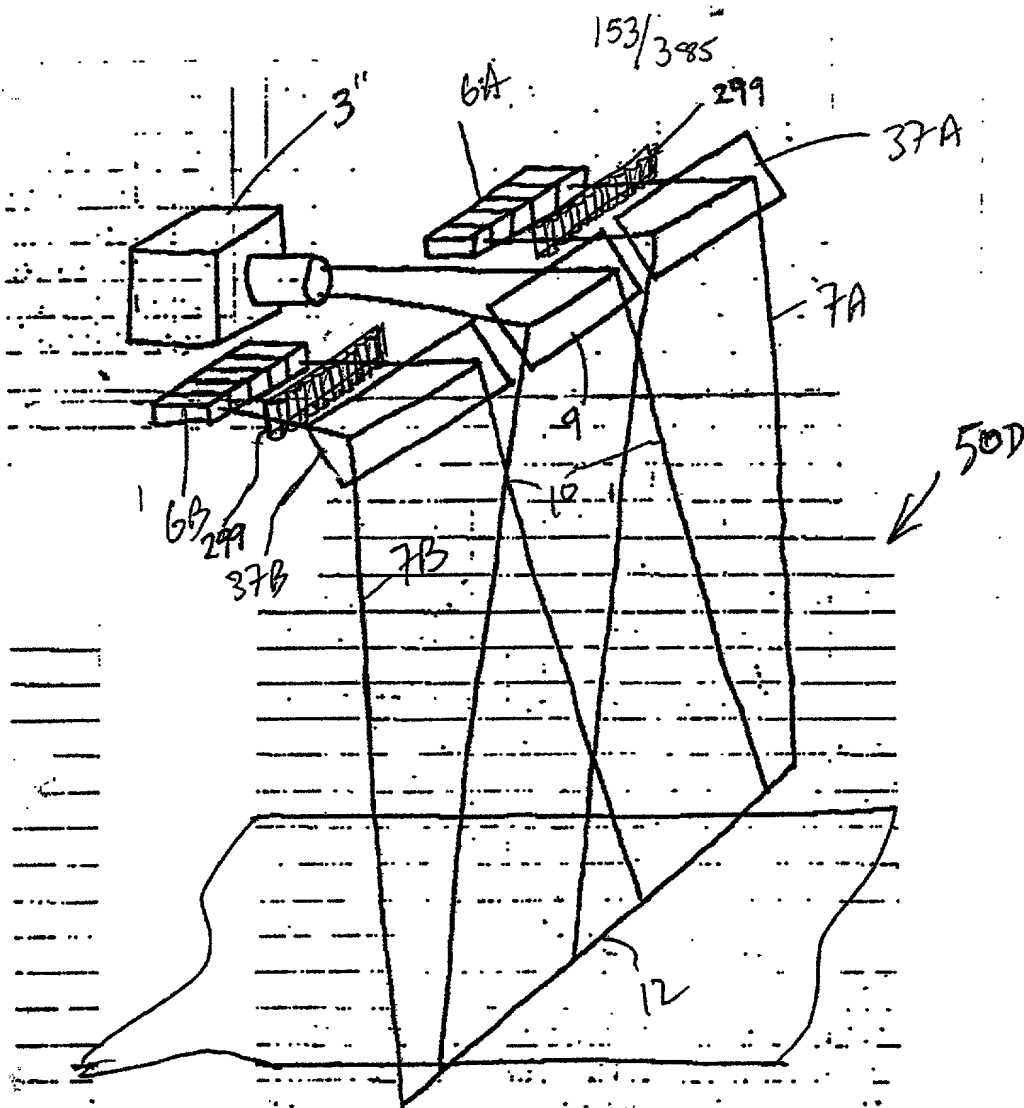


FIG. 3G1

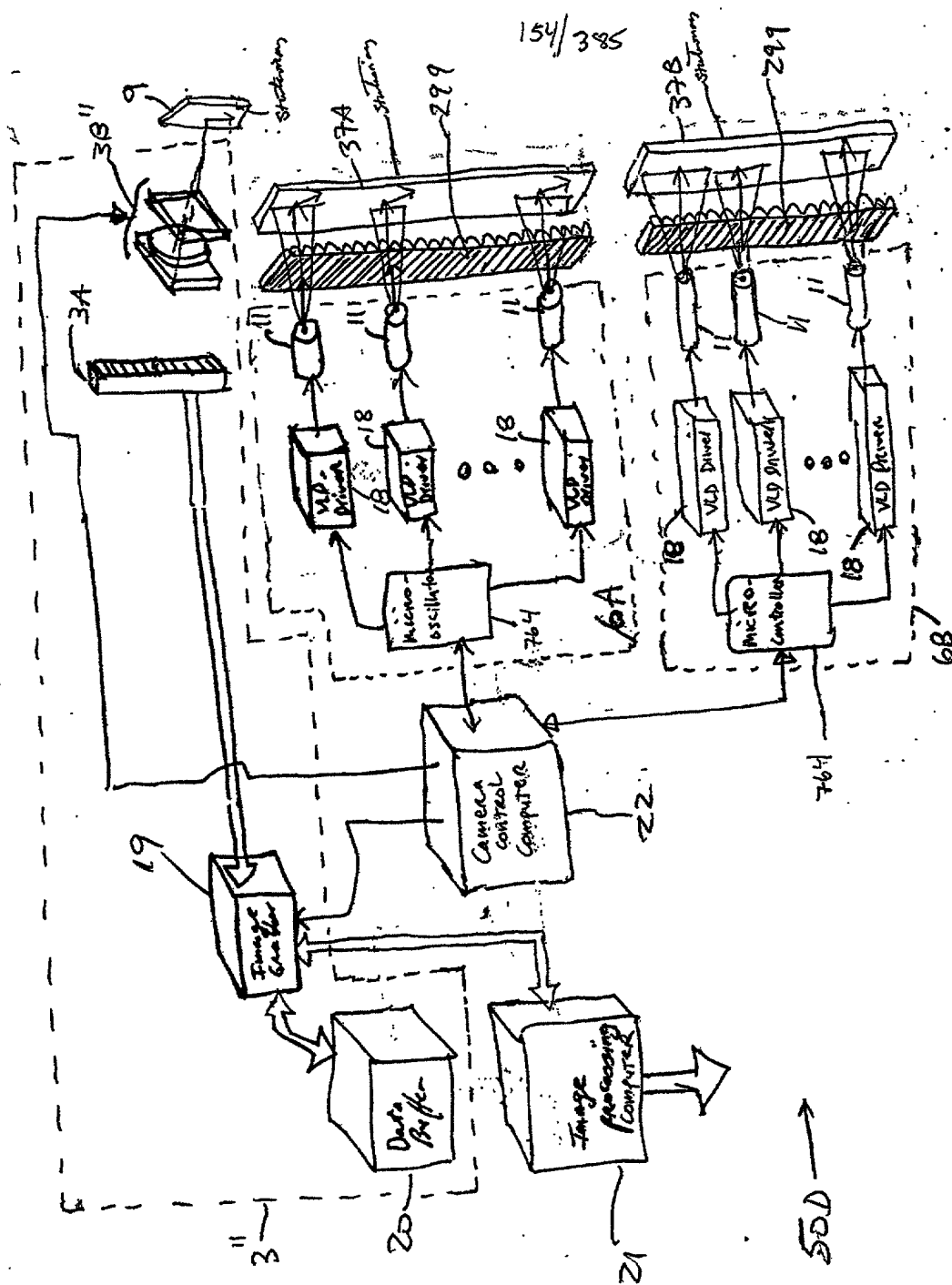


FIG. 362

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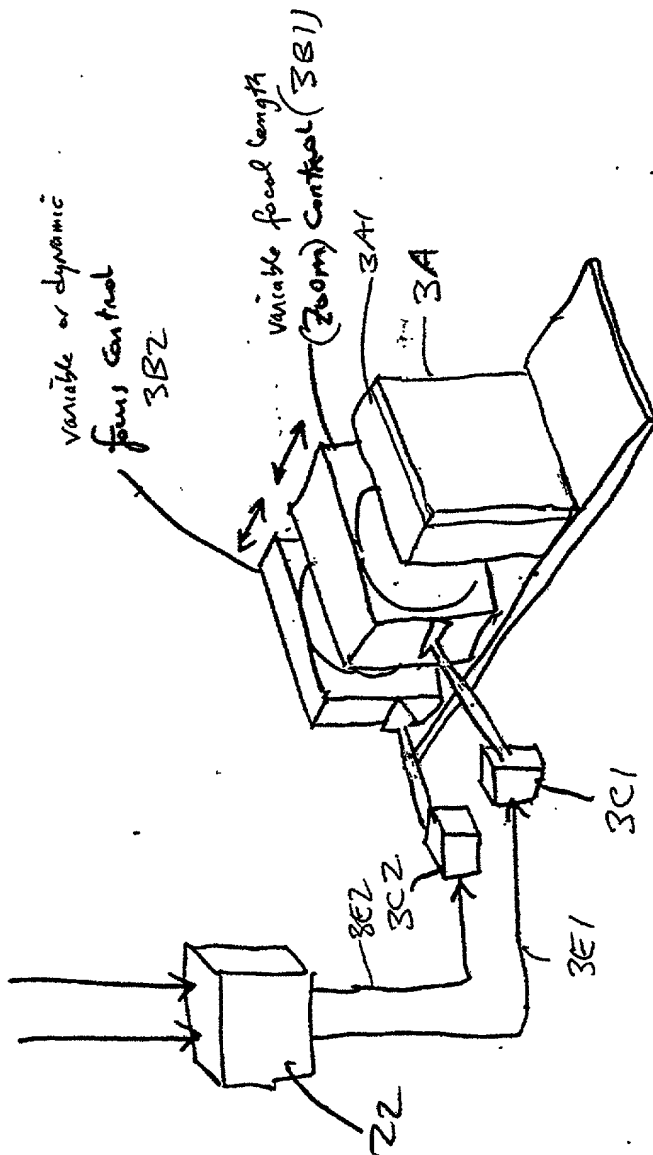


FIG. 3G3

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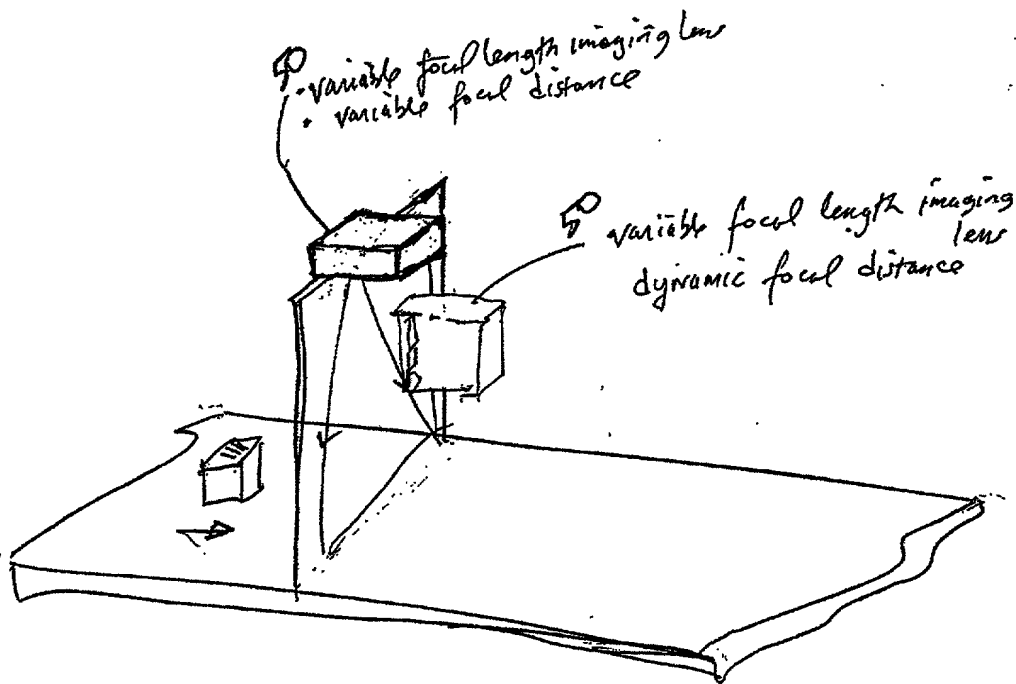


FIG. 3H





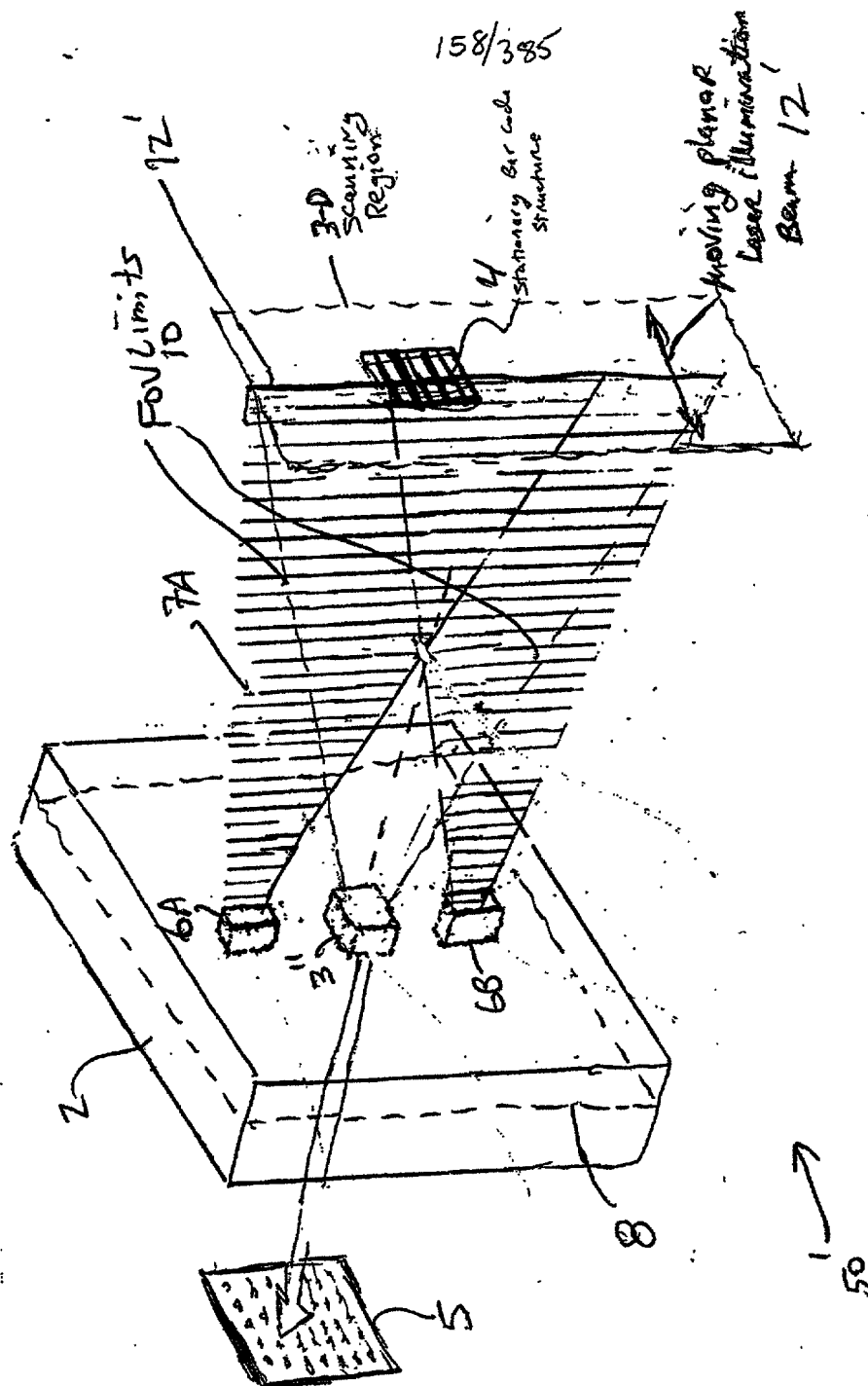


FIG. 3J1

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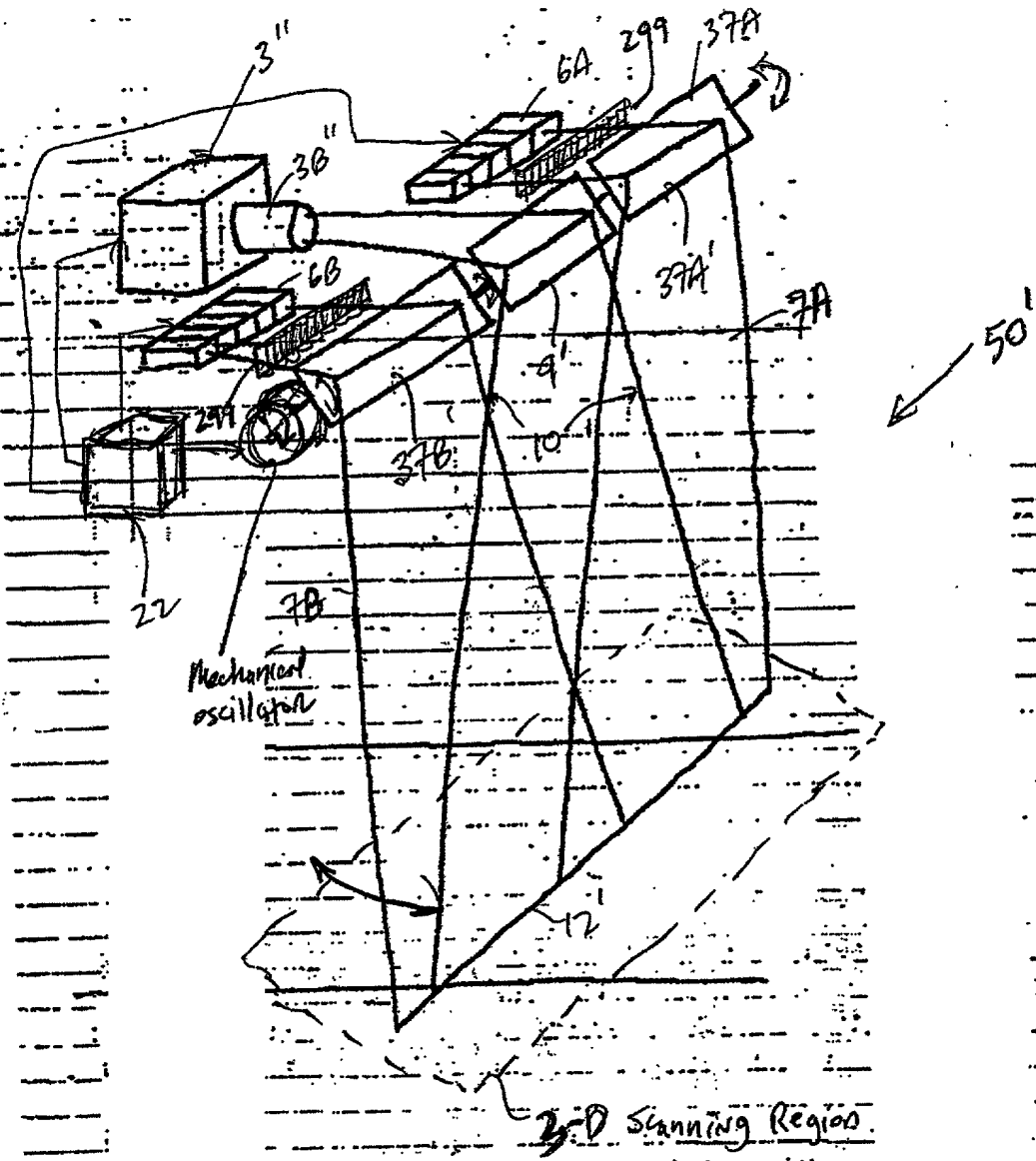


FIG 3J2



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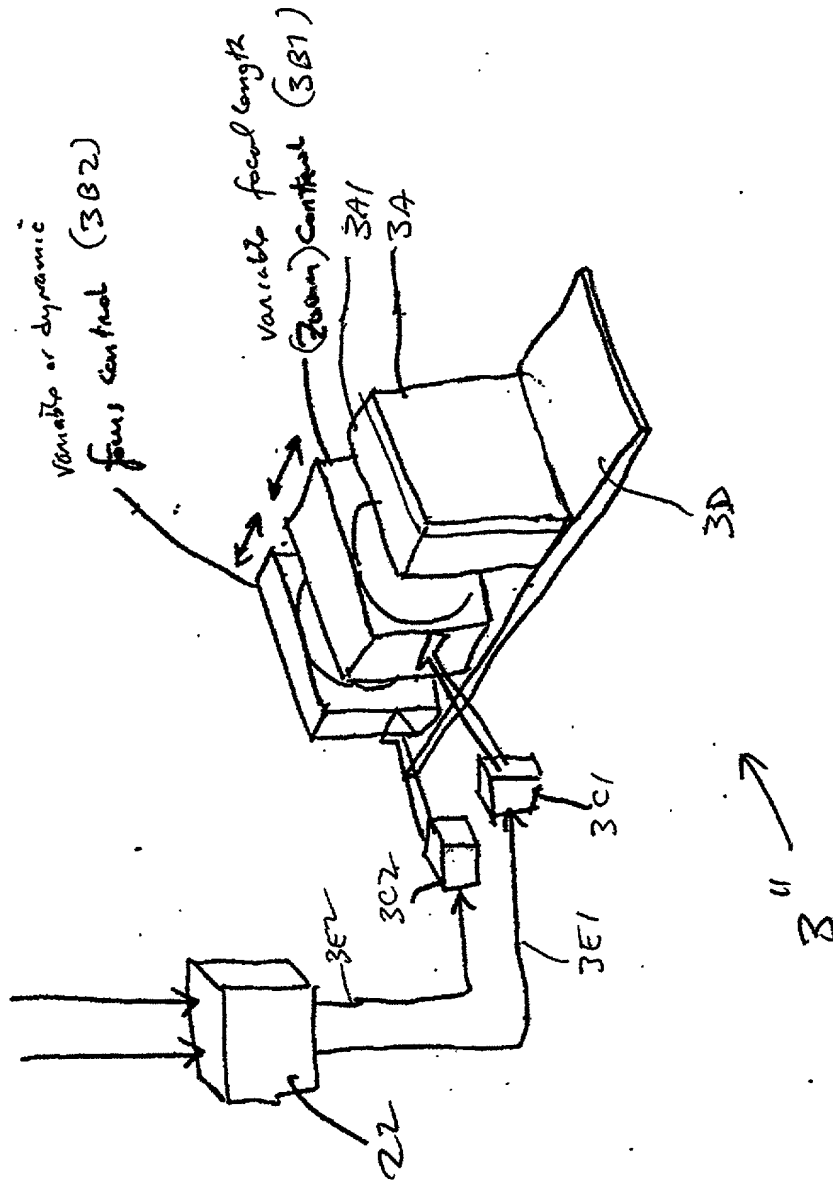


FIG. 3J4

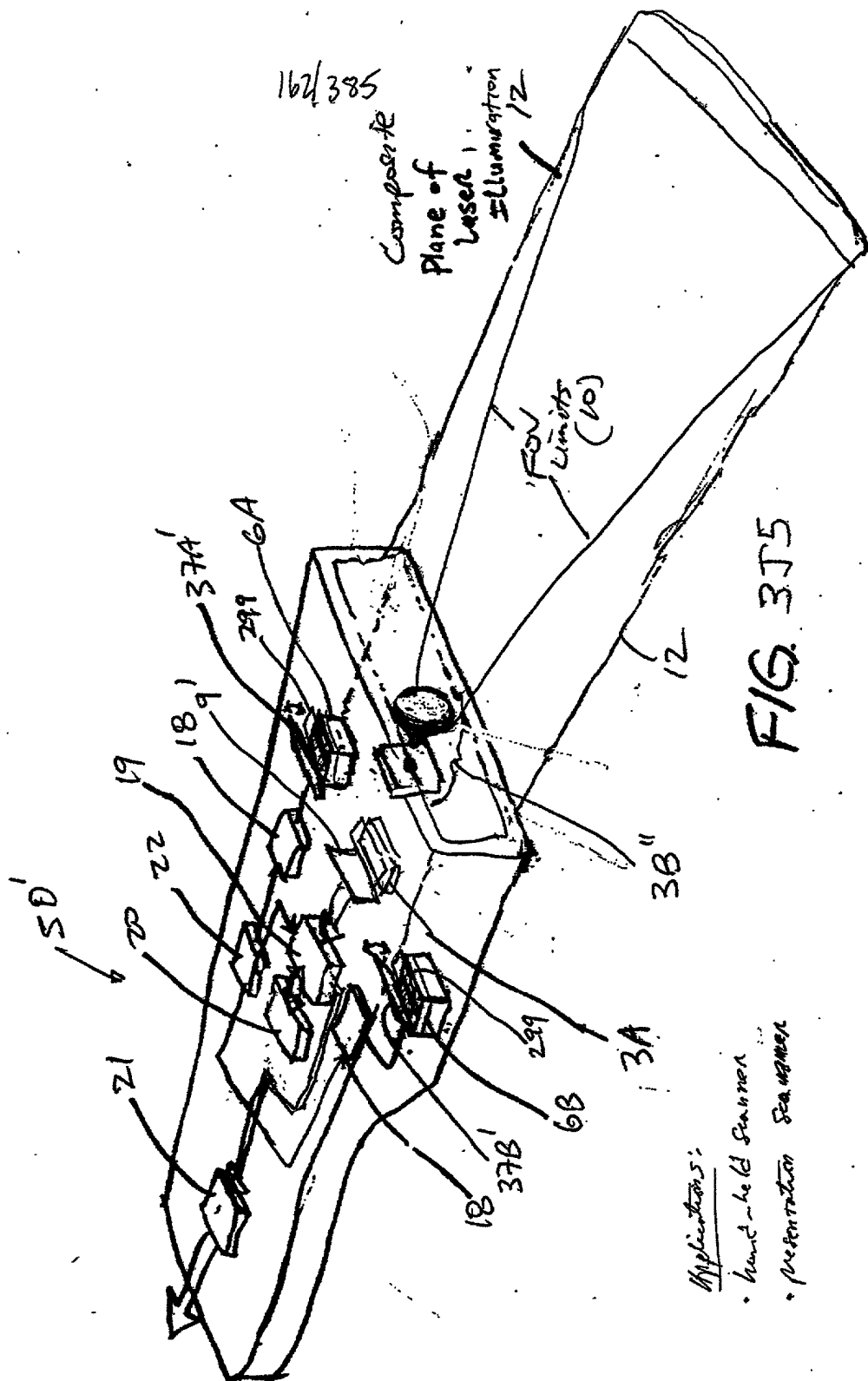
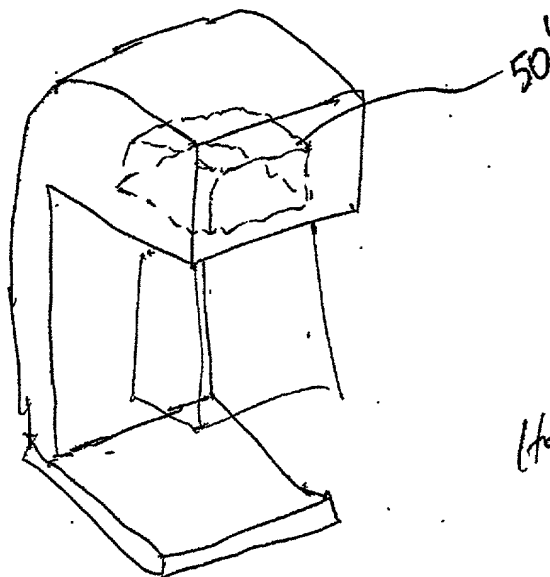


FIG. 3T5

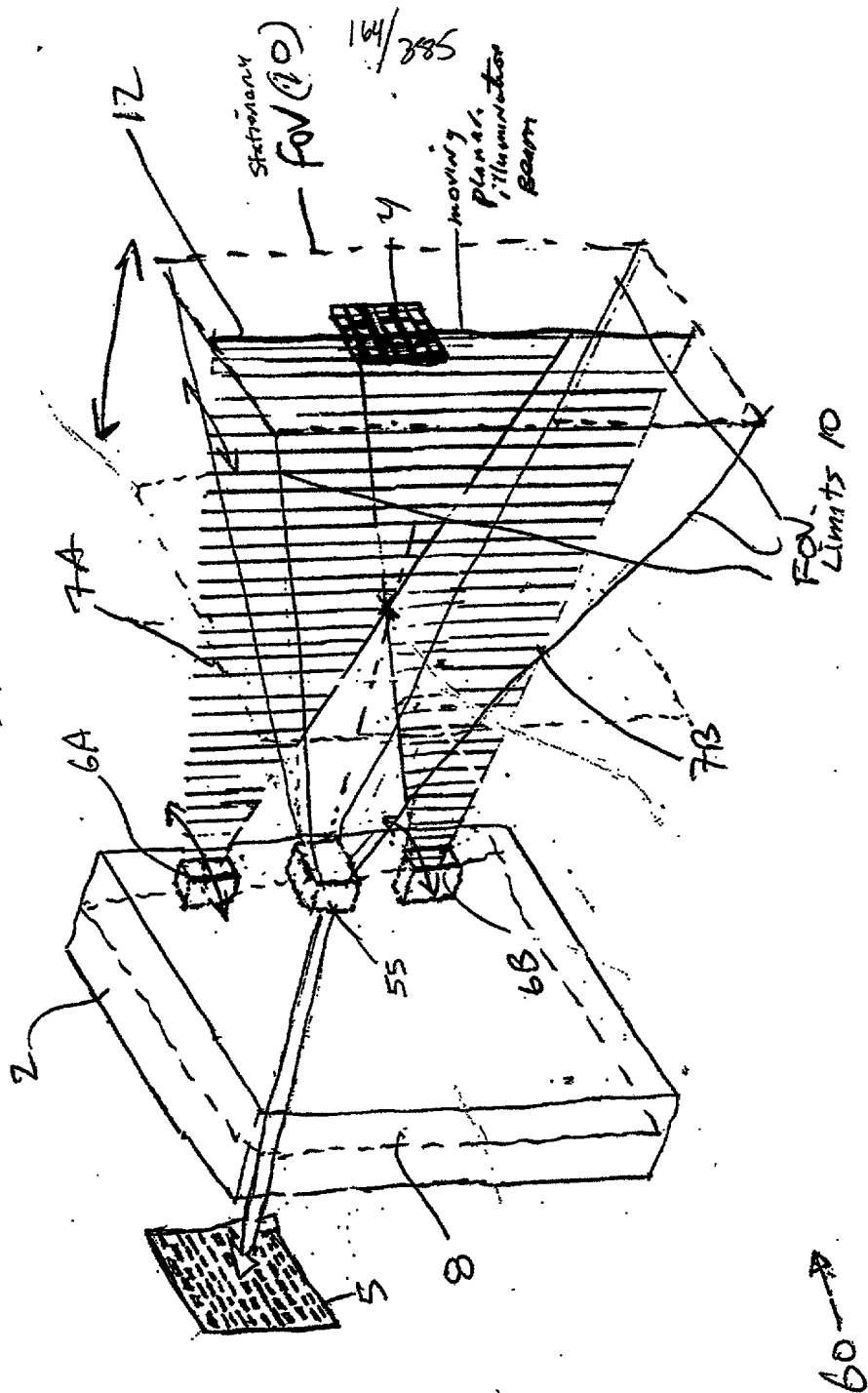
- Applications:
- Hand-held Scanner
  - Presentation Scanner

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2-D  
Hold-under  
Scanner

FIG-316





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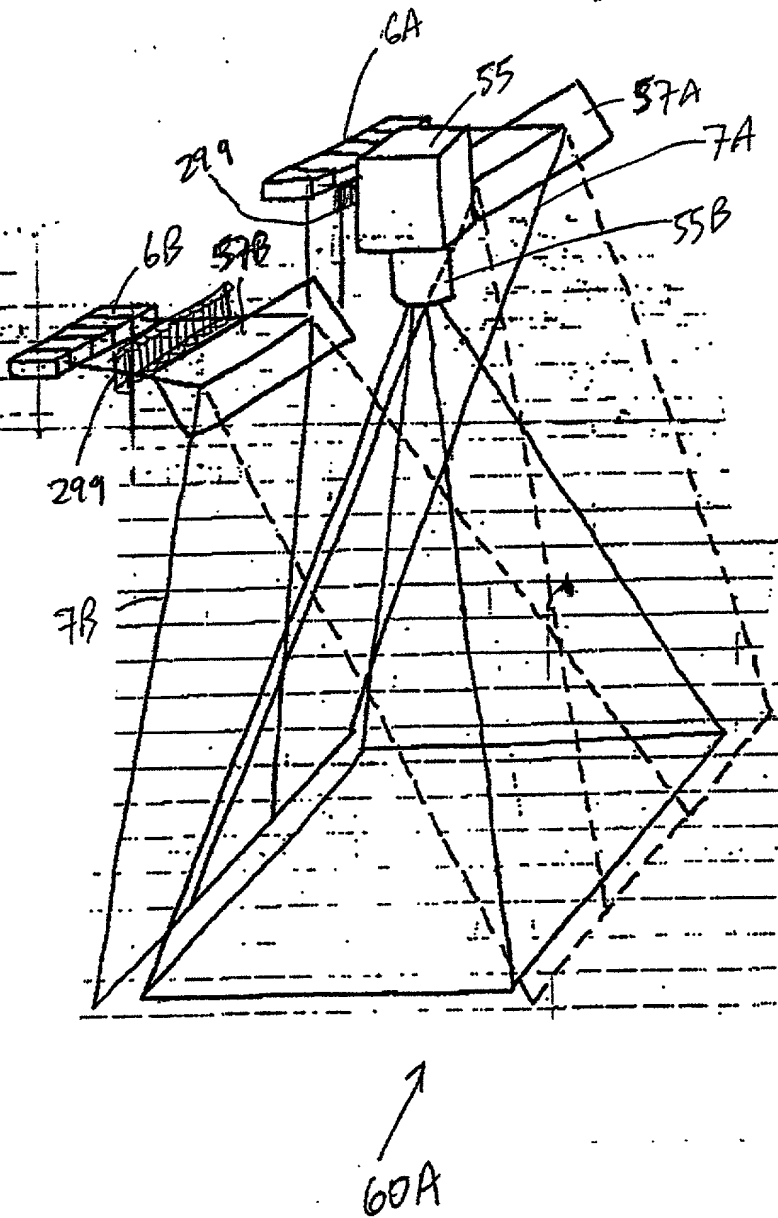


FIG. 4B1

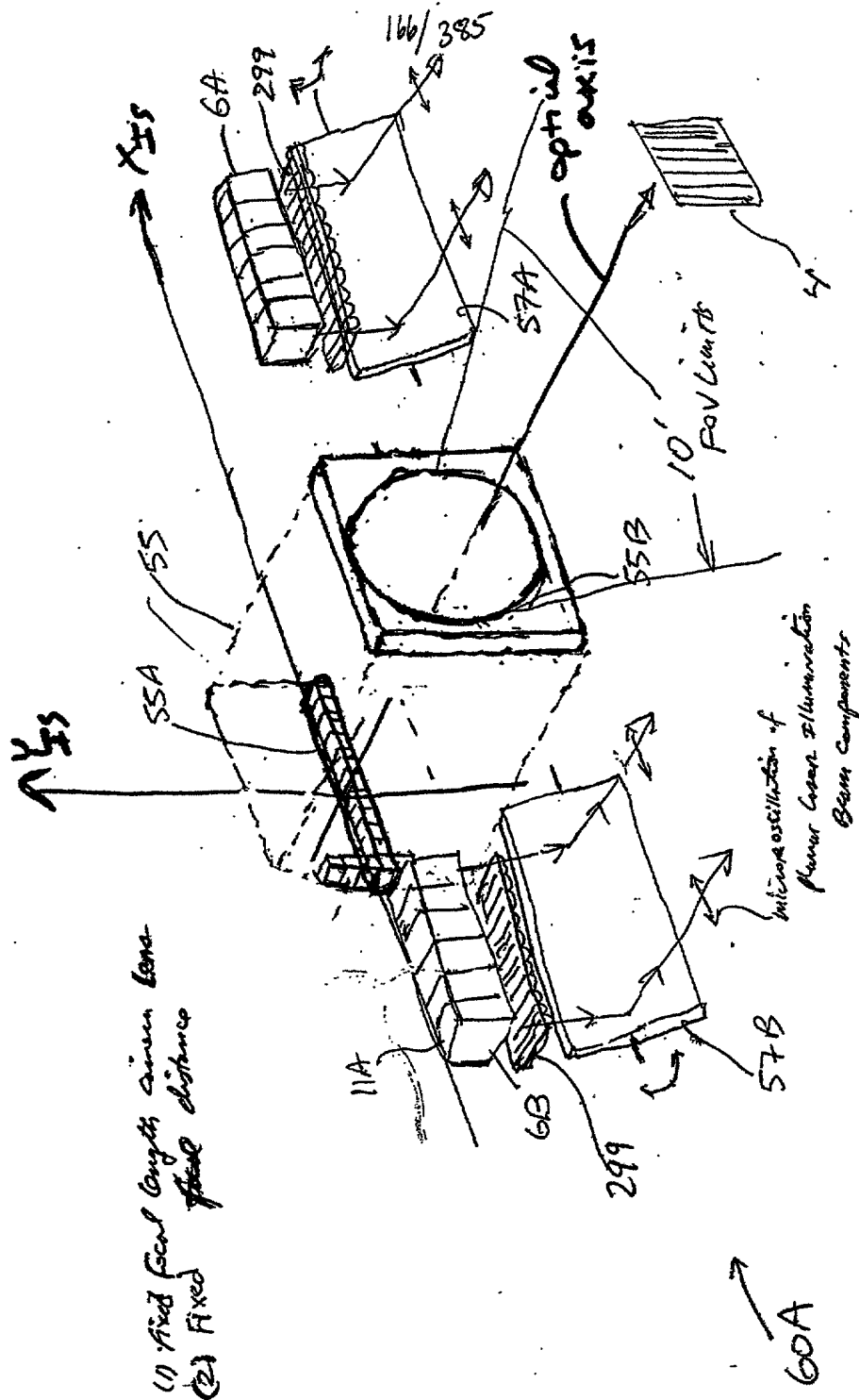
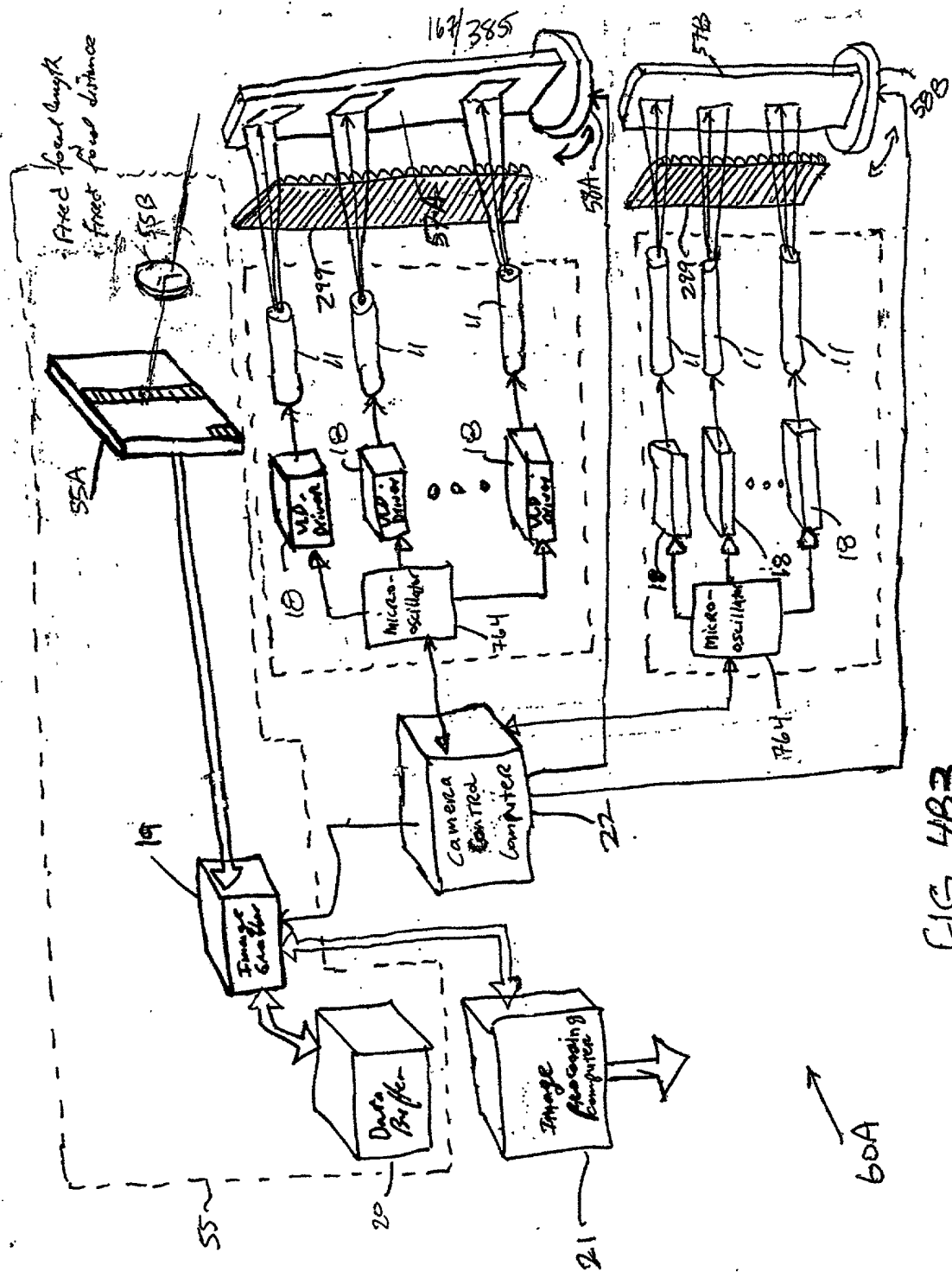


FIG. 4B.Z



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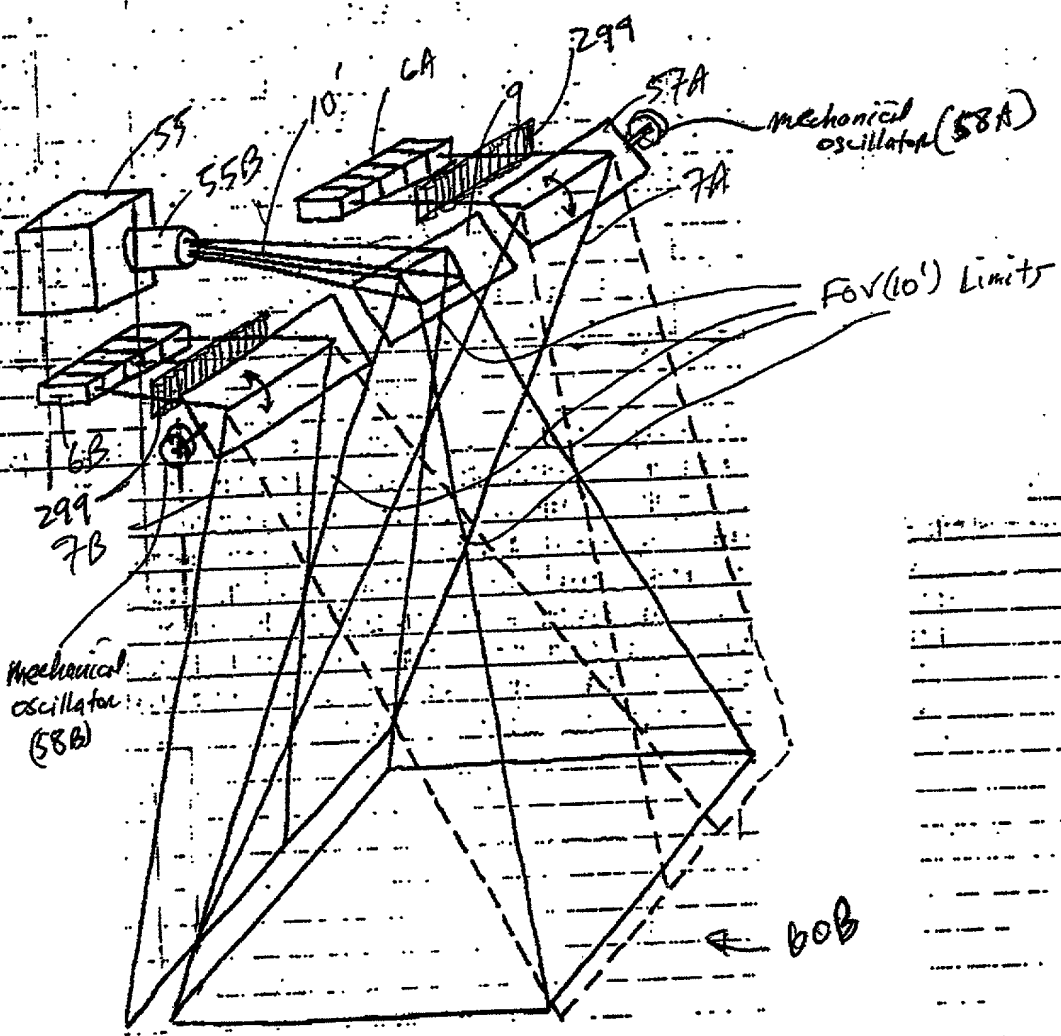


FIG. 4C1

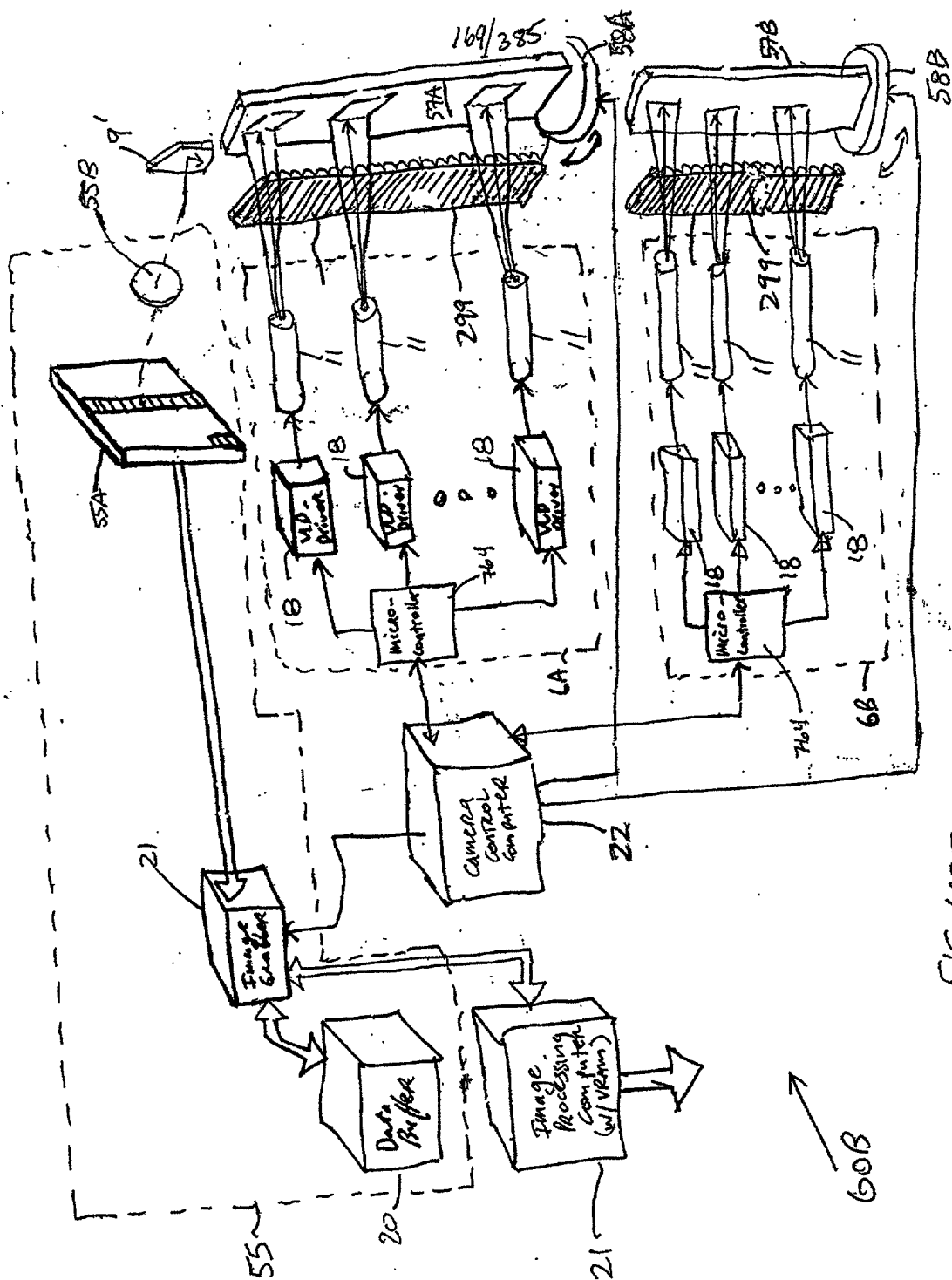


FIG. 4CZ

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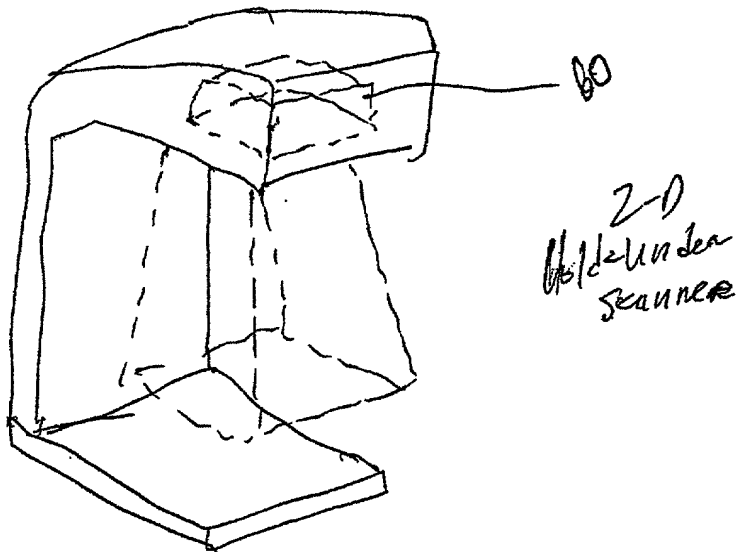


FIG. 4D

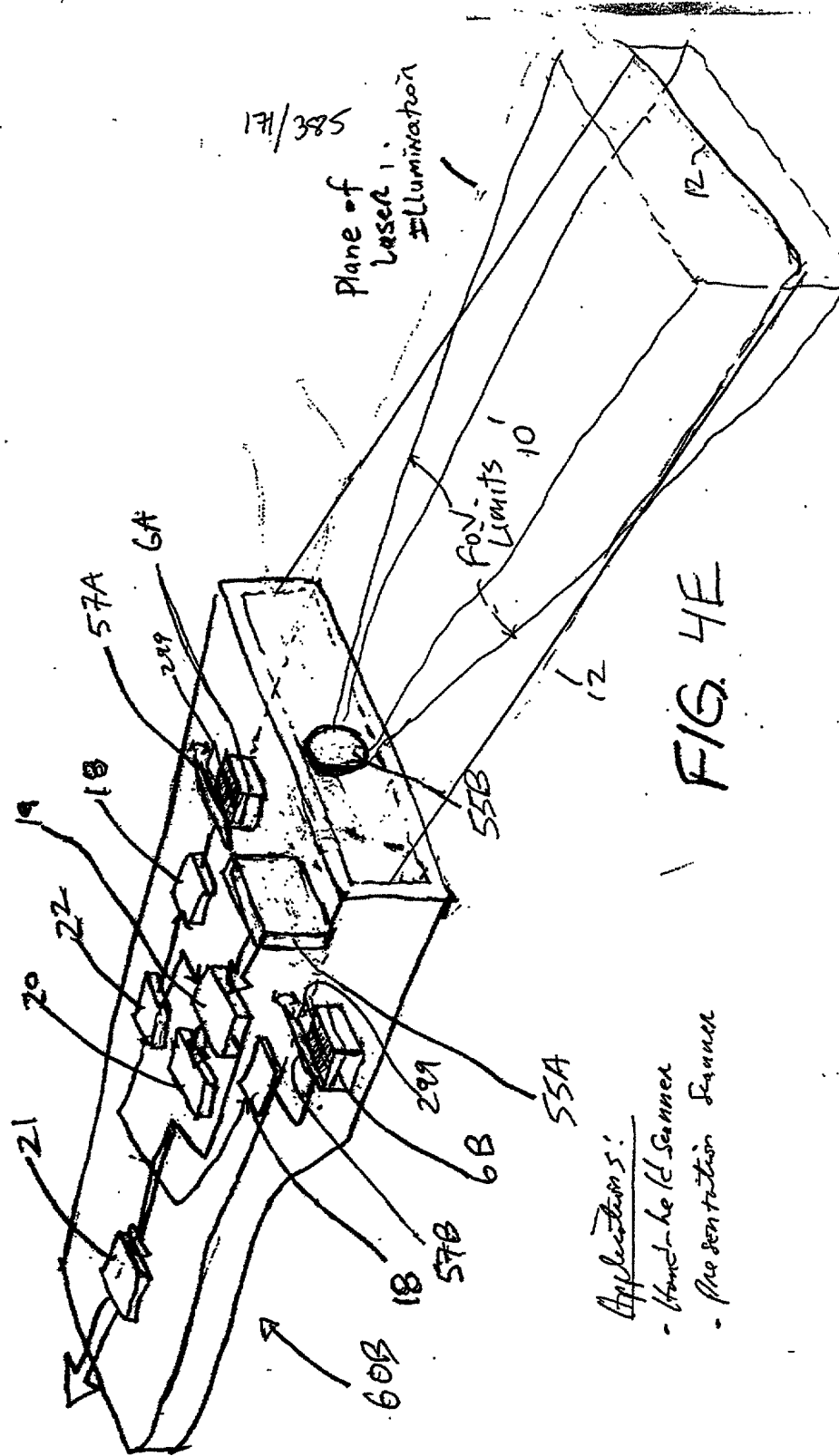


FIG. 4E

- Applications:
- Hand-held Scanner
  - Presentation Scanner

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CC

OC

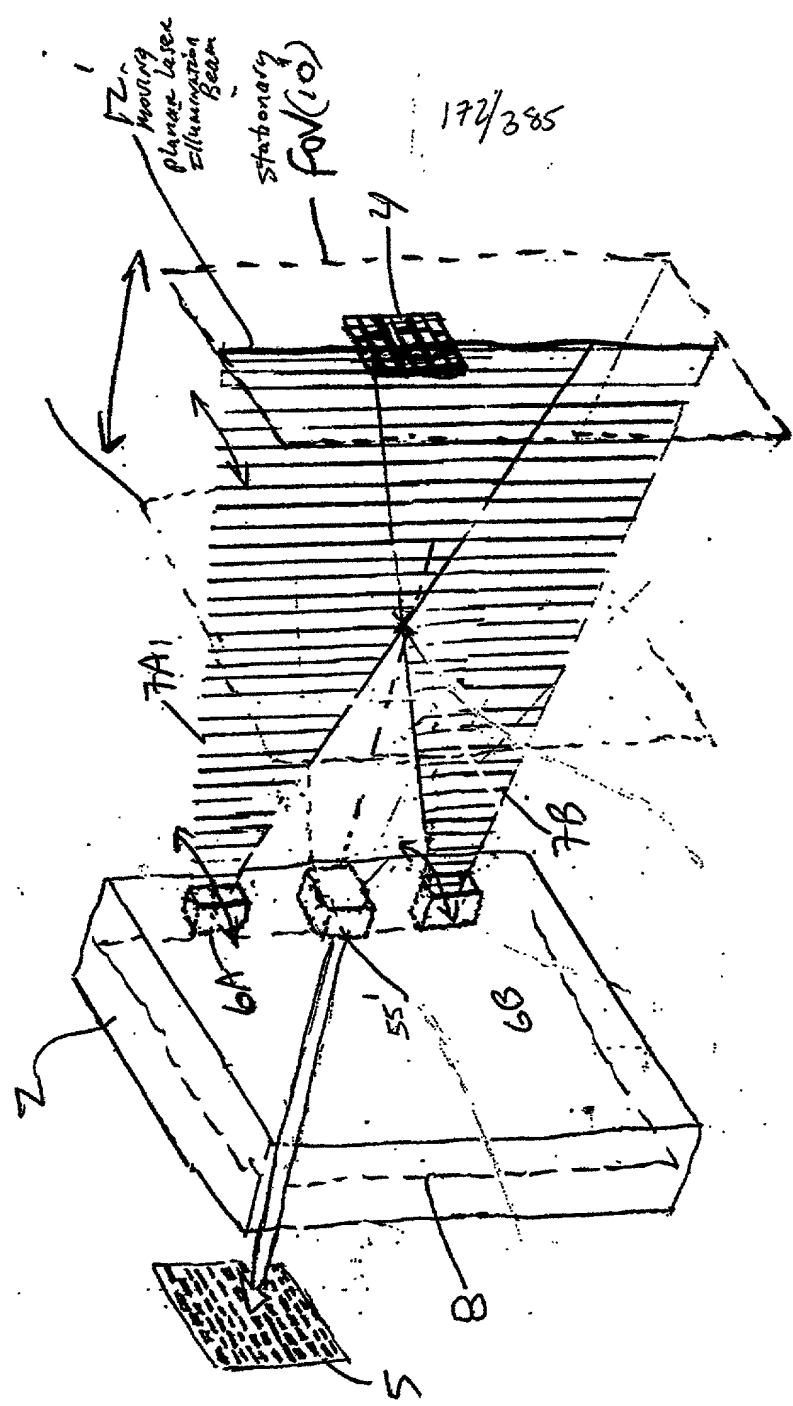


FIG 5A

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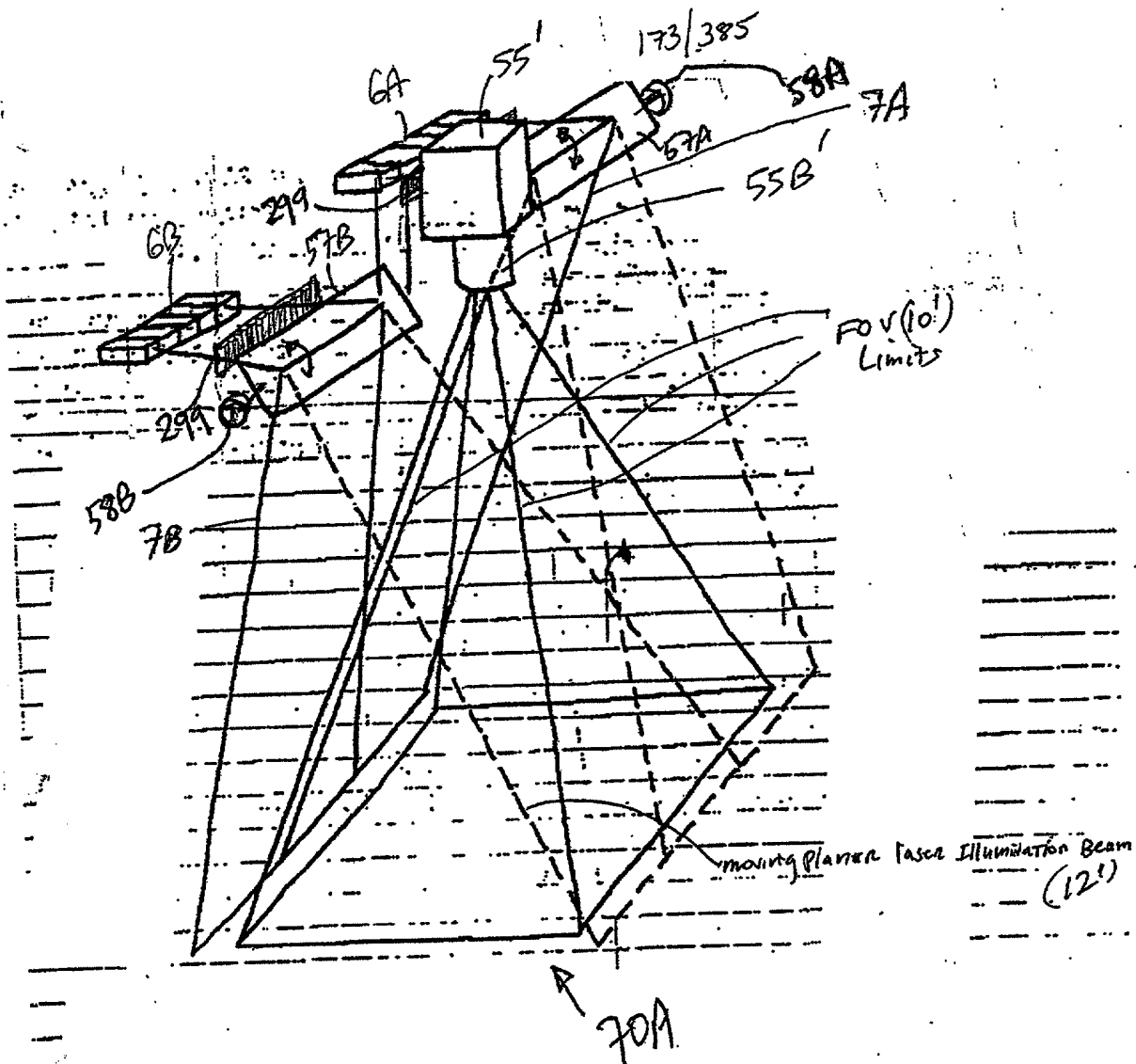


FIG 5B1

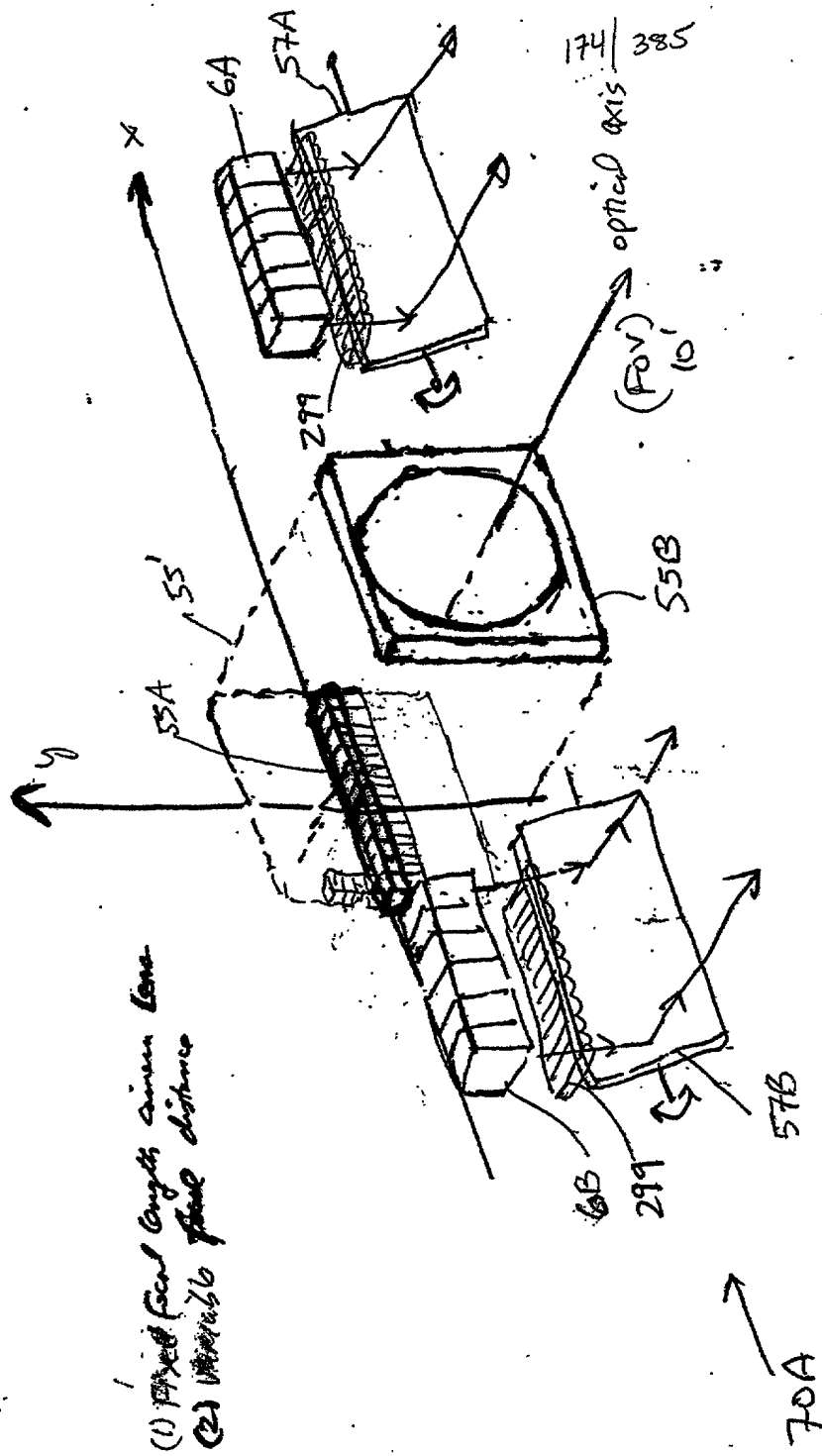
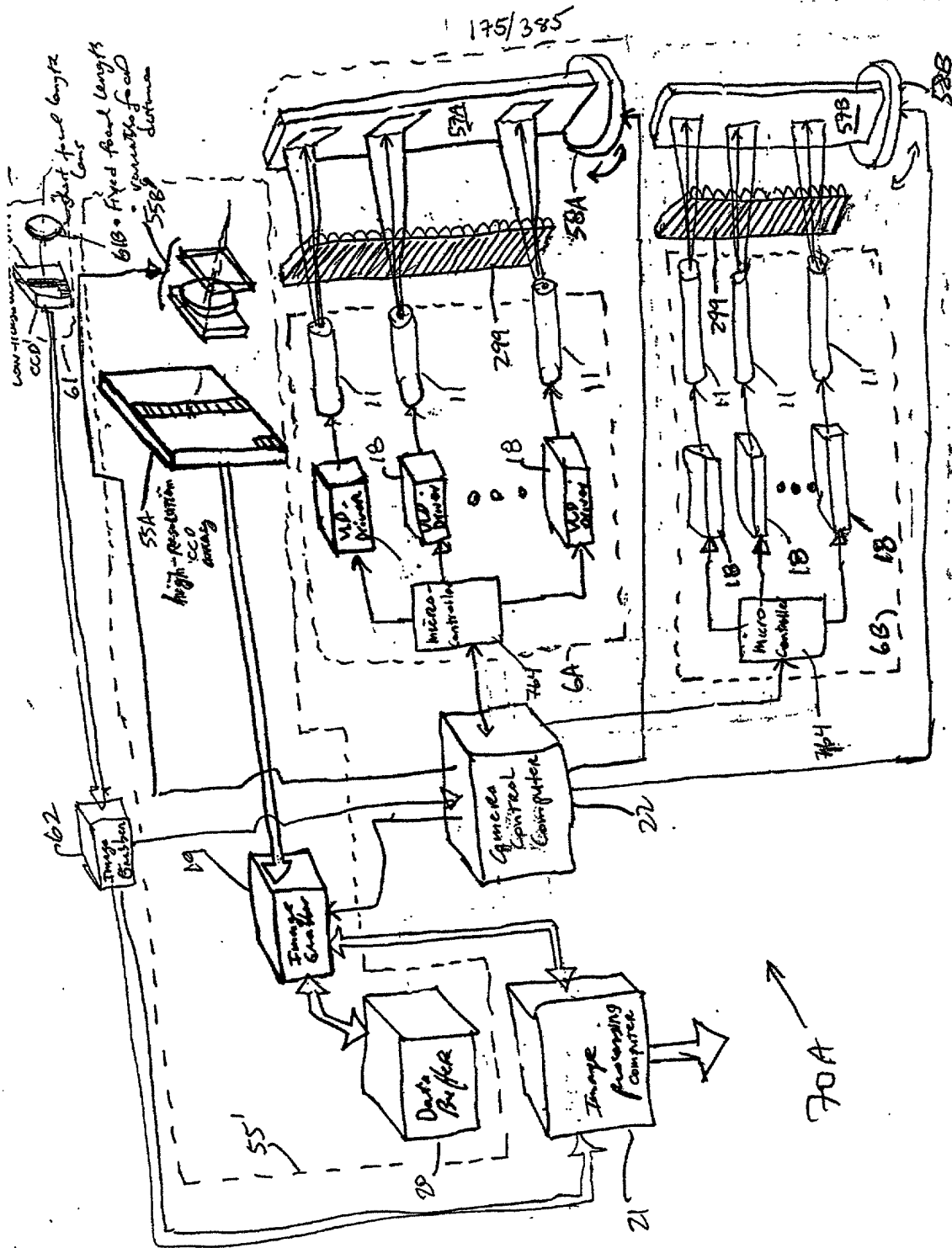


FIG. 5B2



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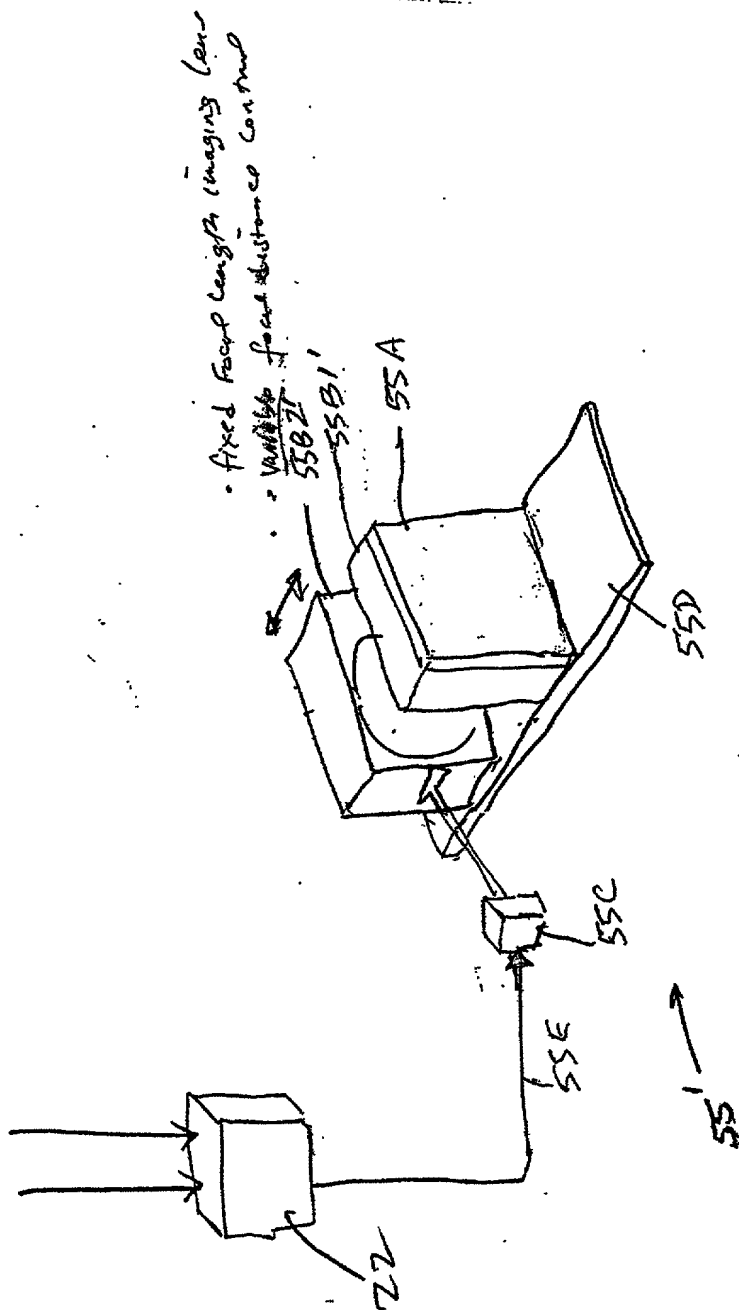


FIG. 5B4

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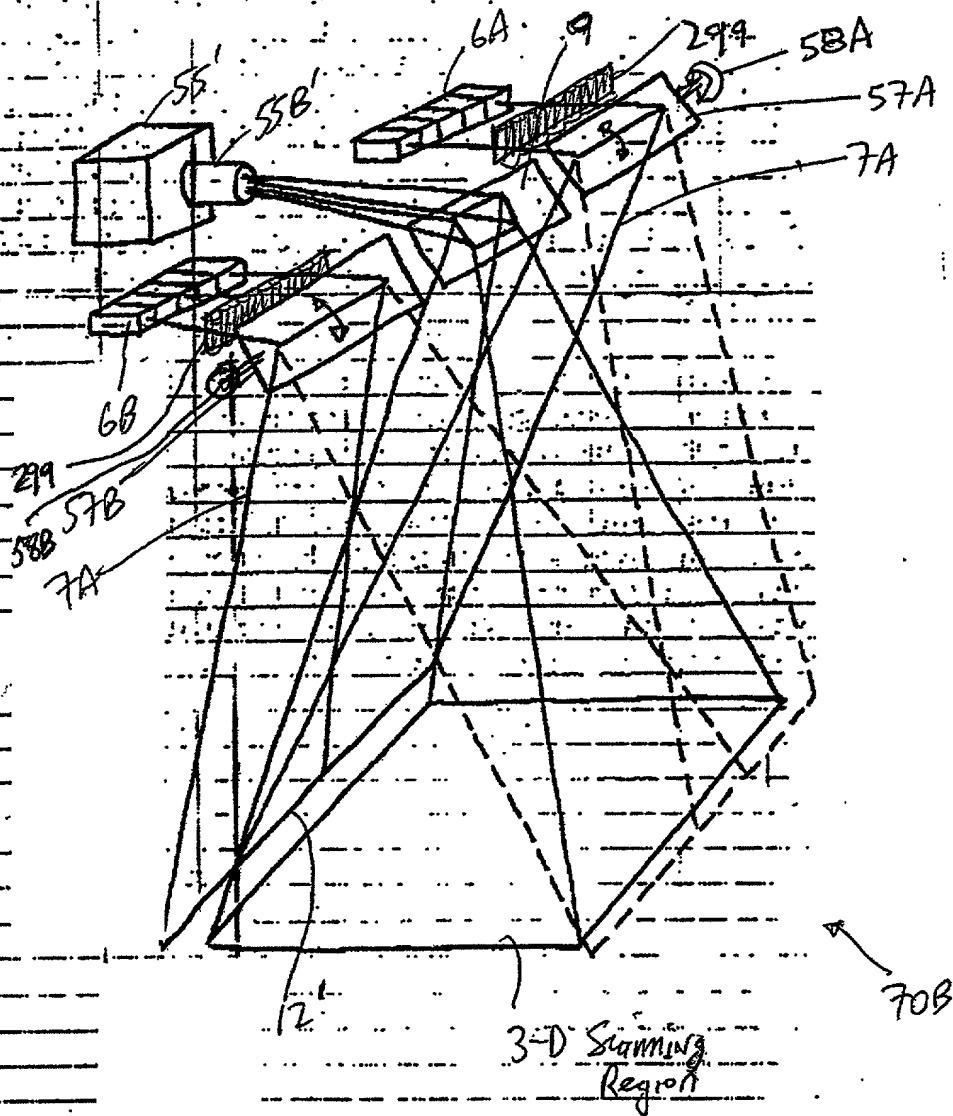


FIG. 5C1

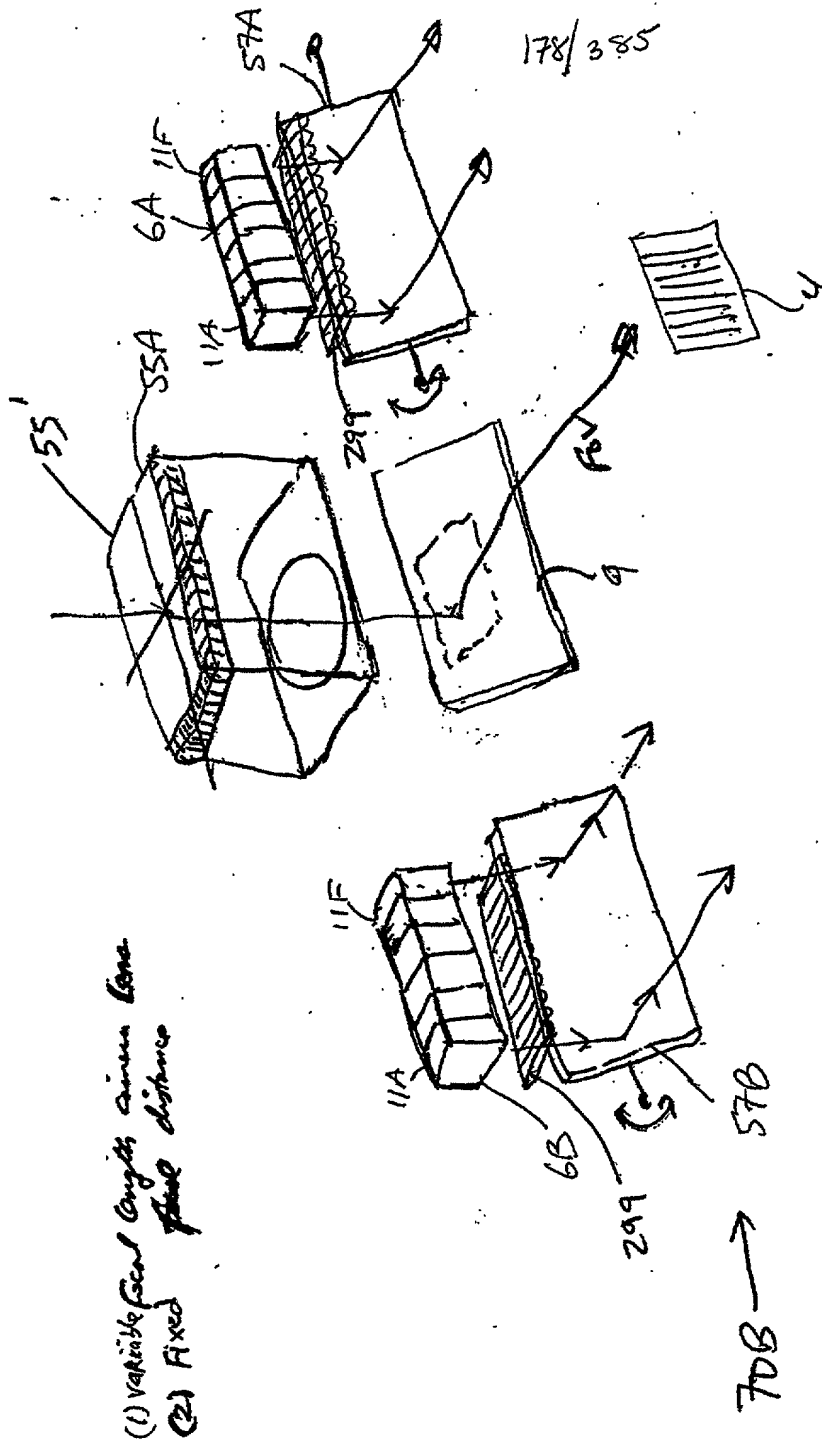


FIG. 5C

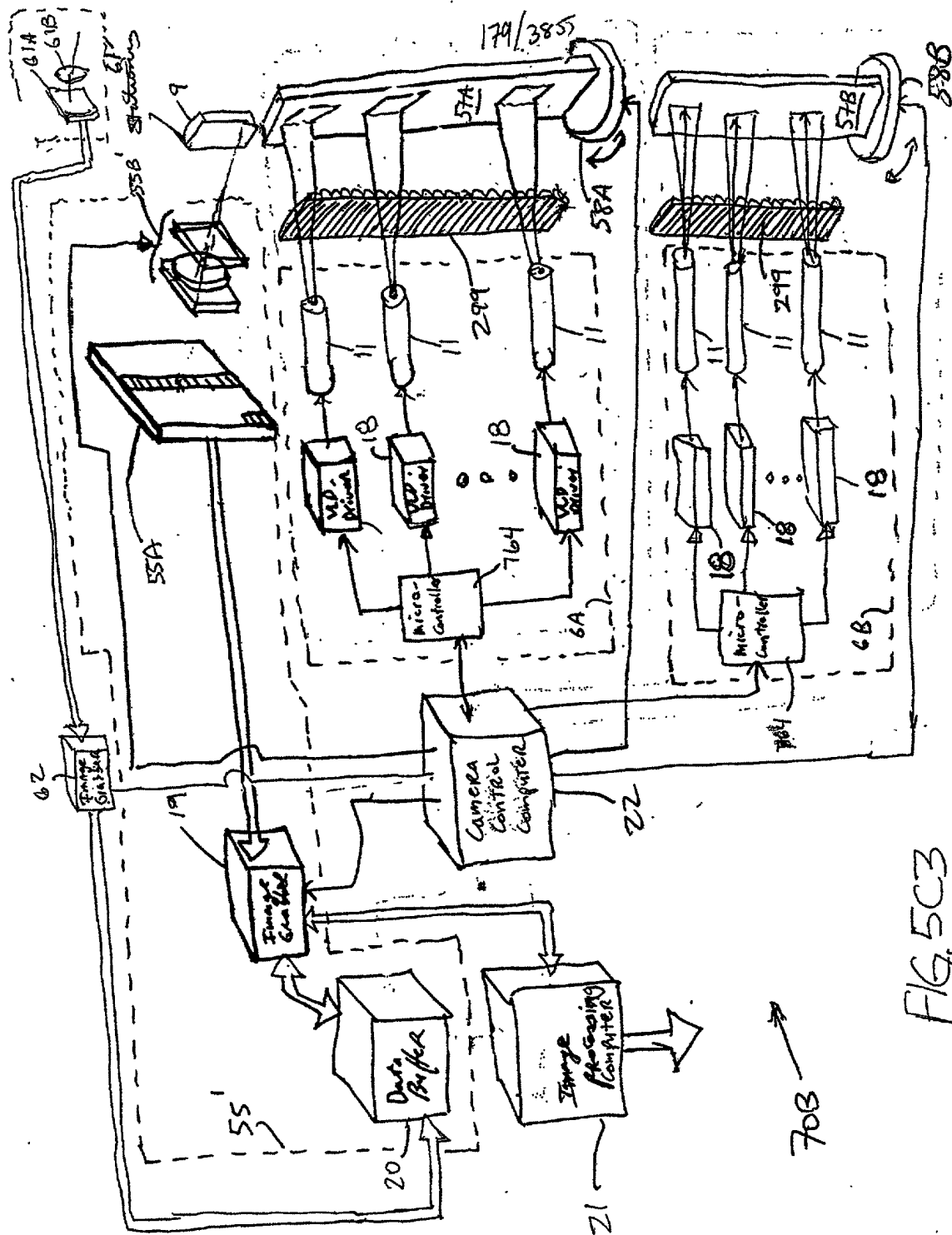


FIG. 5C3

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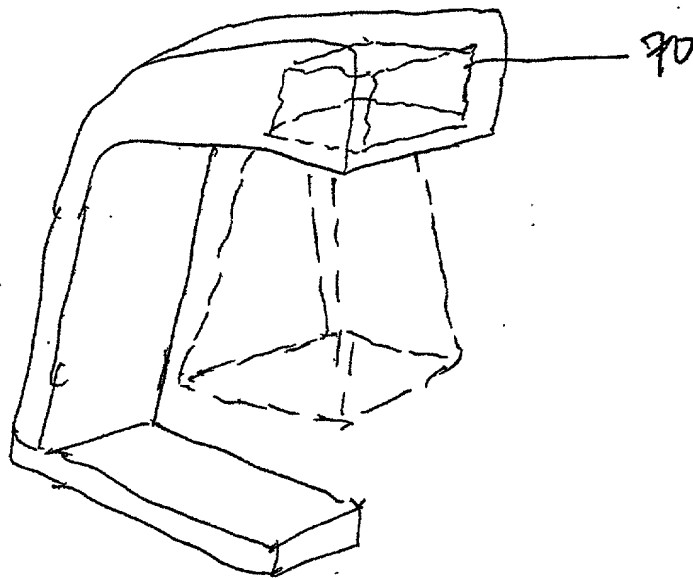
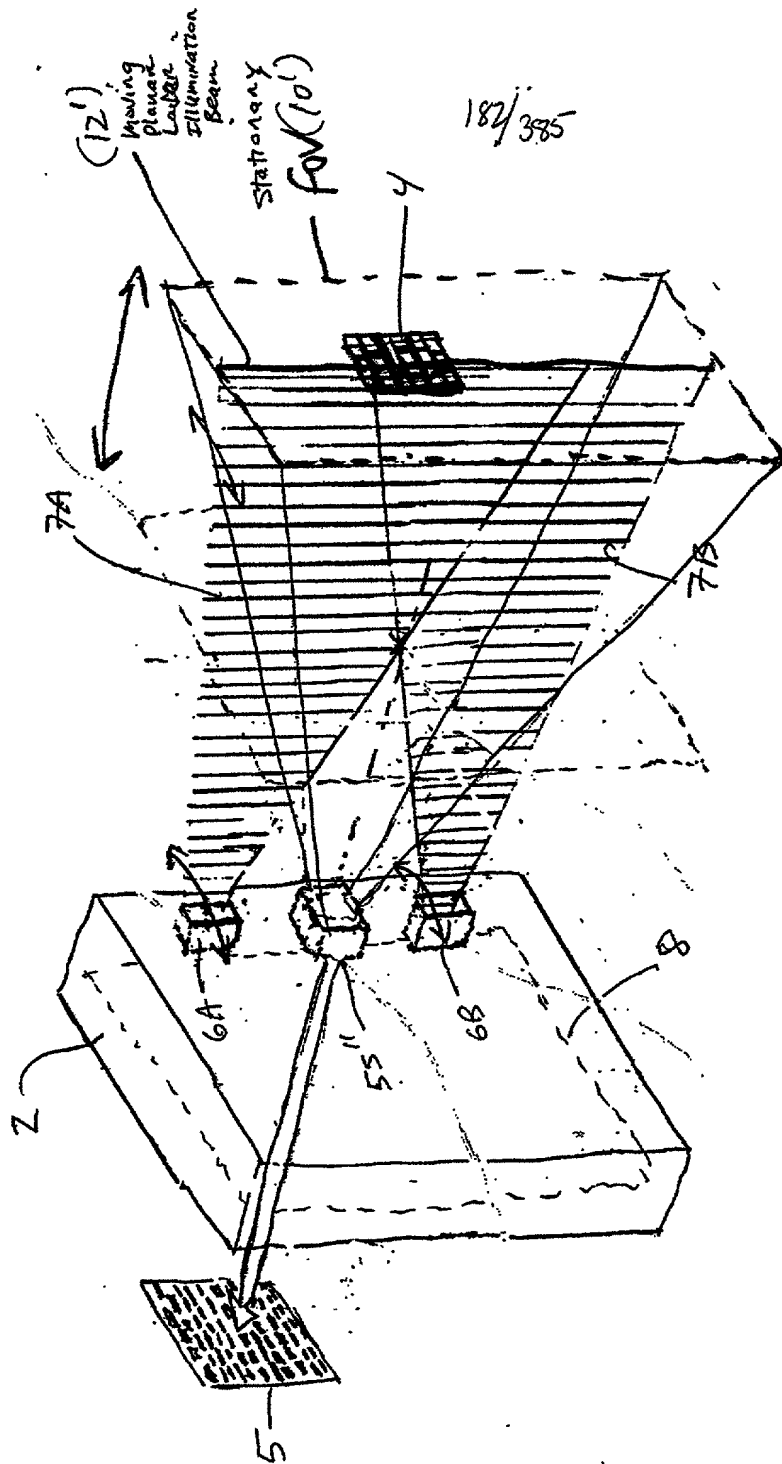


FIG. 5D



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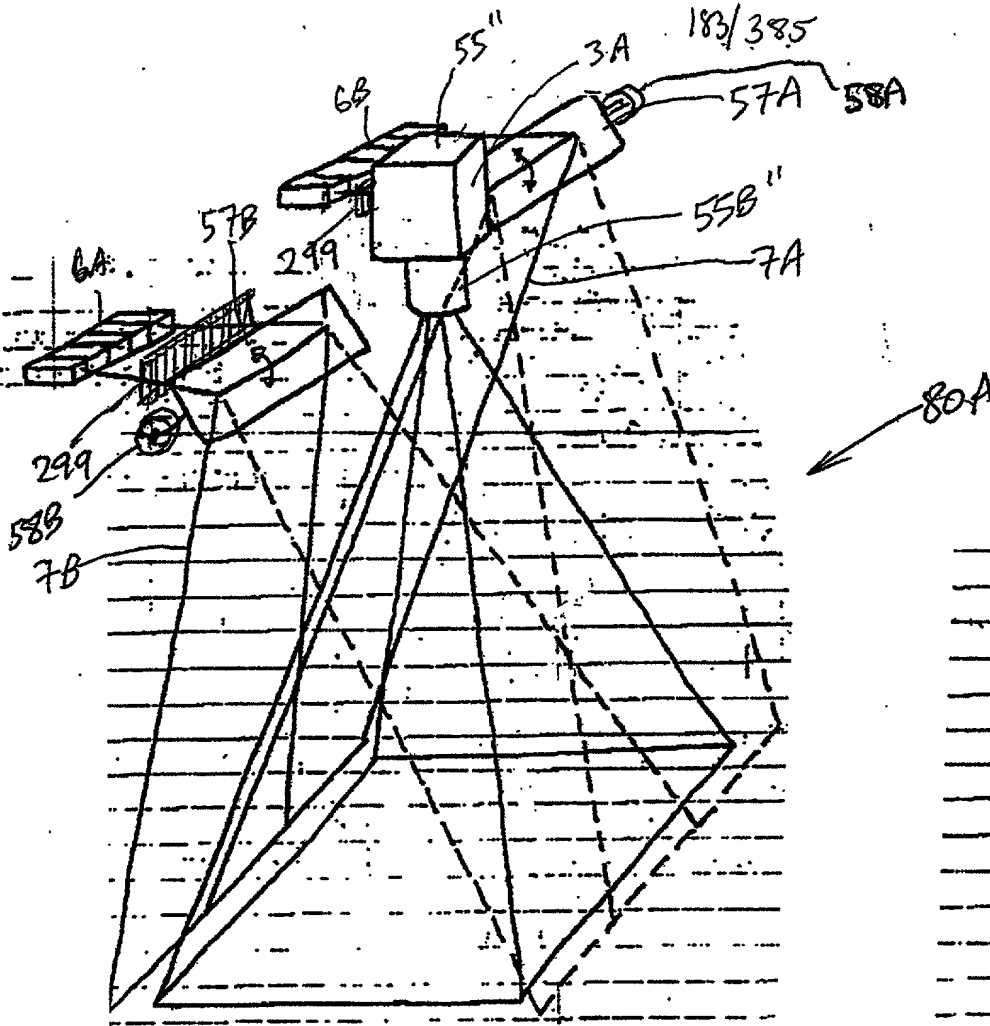
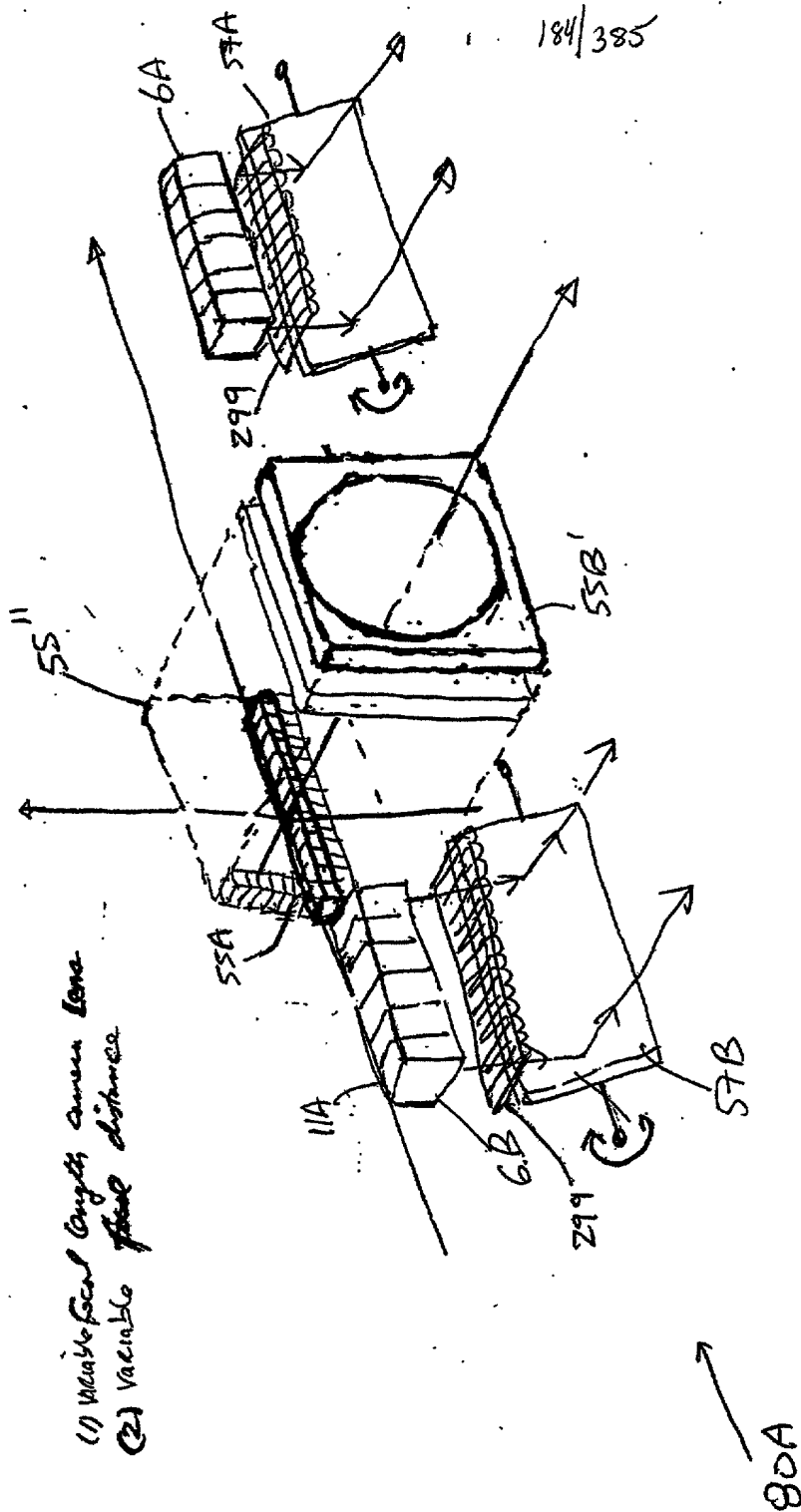


FIG. 6B1

Q

- (1) Variable focal length camera lens
- (2) Variable ~~focal~~ distance



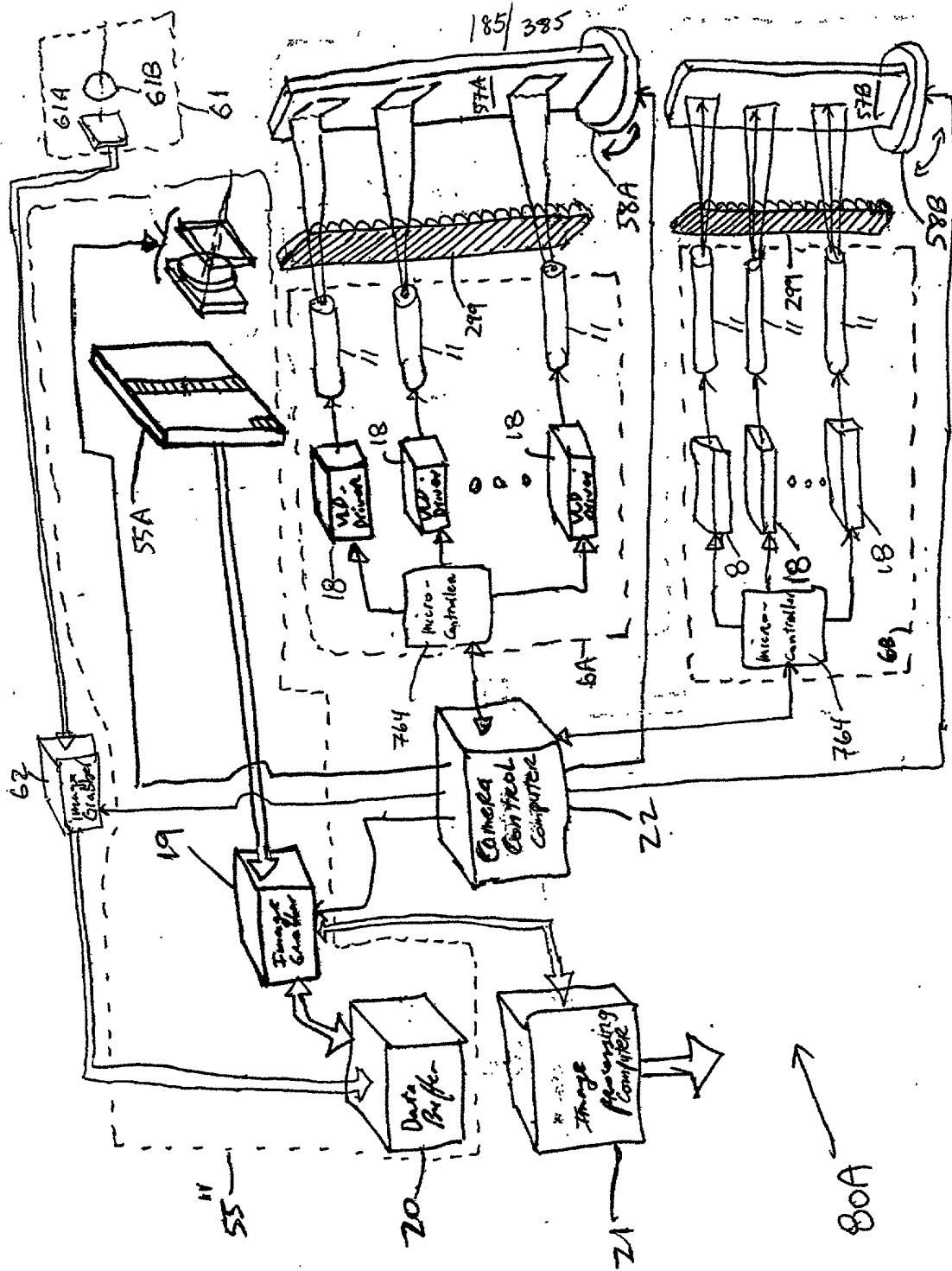


FIG. 6B3

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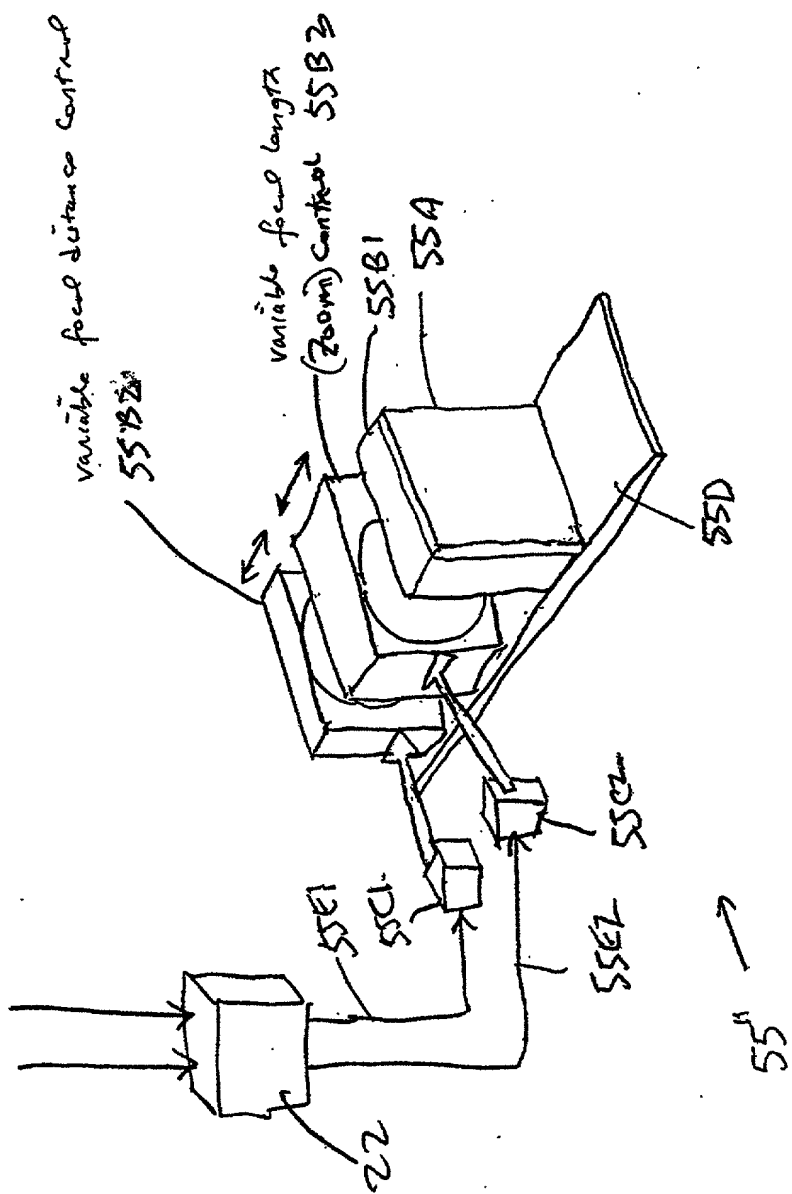


FIG. 6B4

20250606 14:00:00

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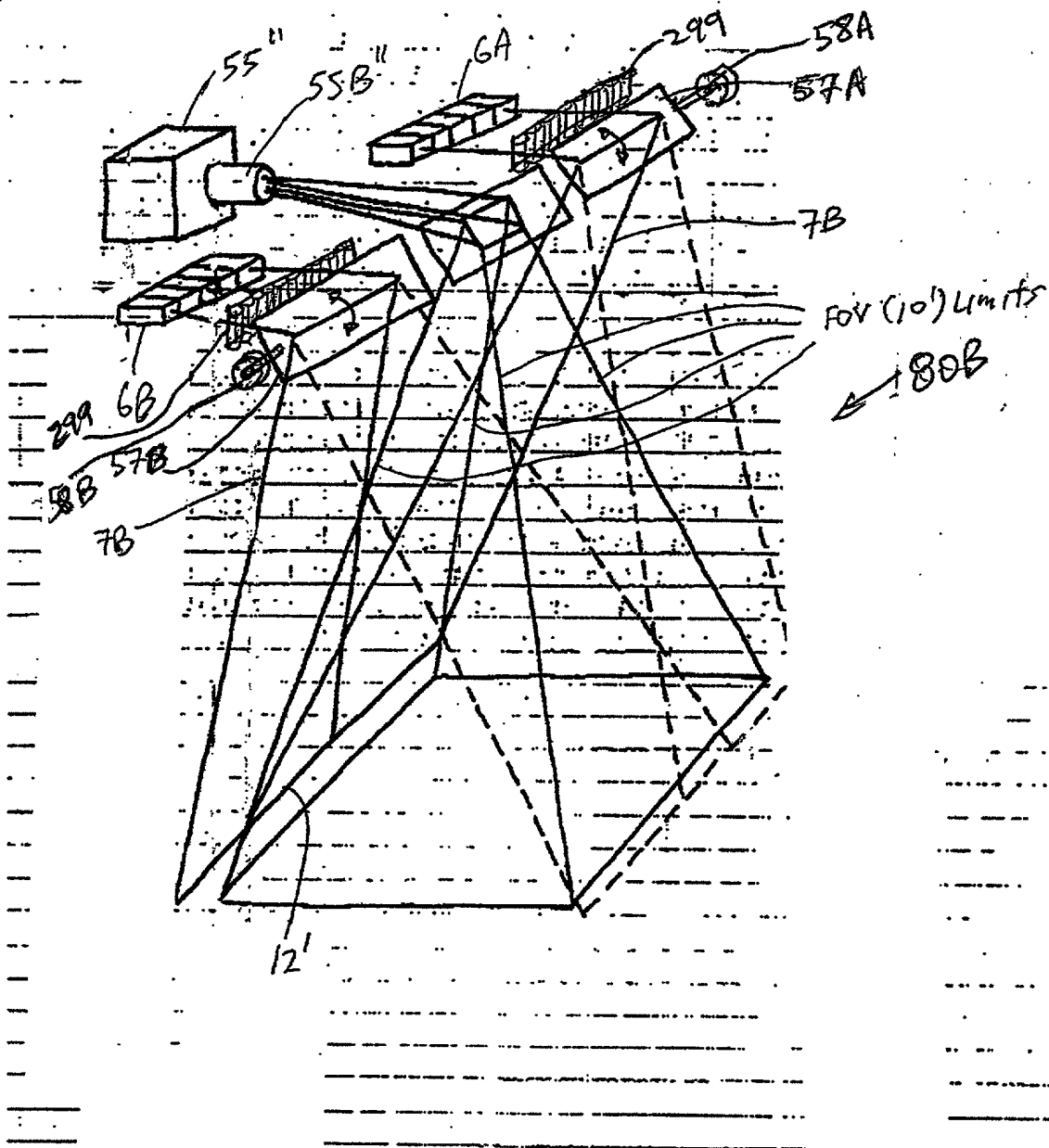


FIG. 6C1

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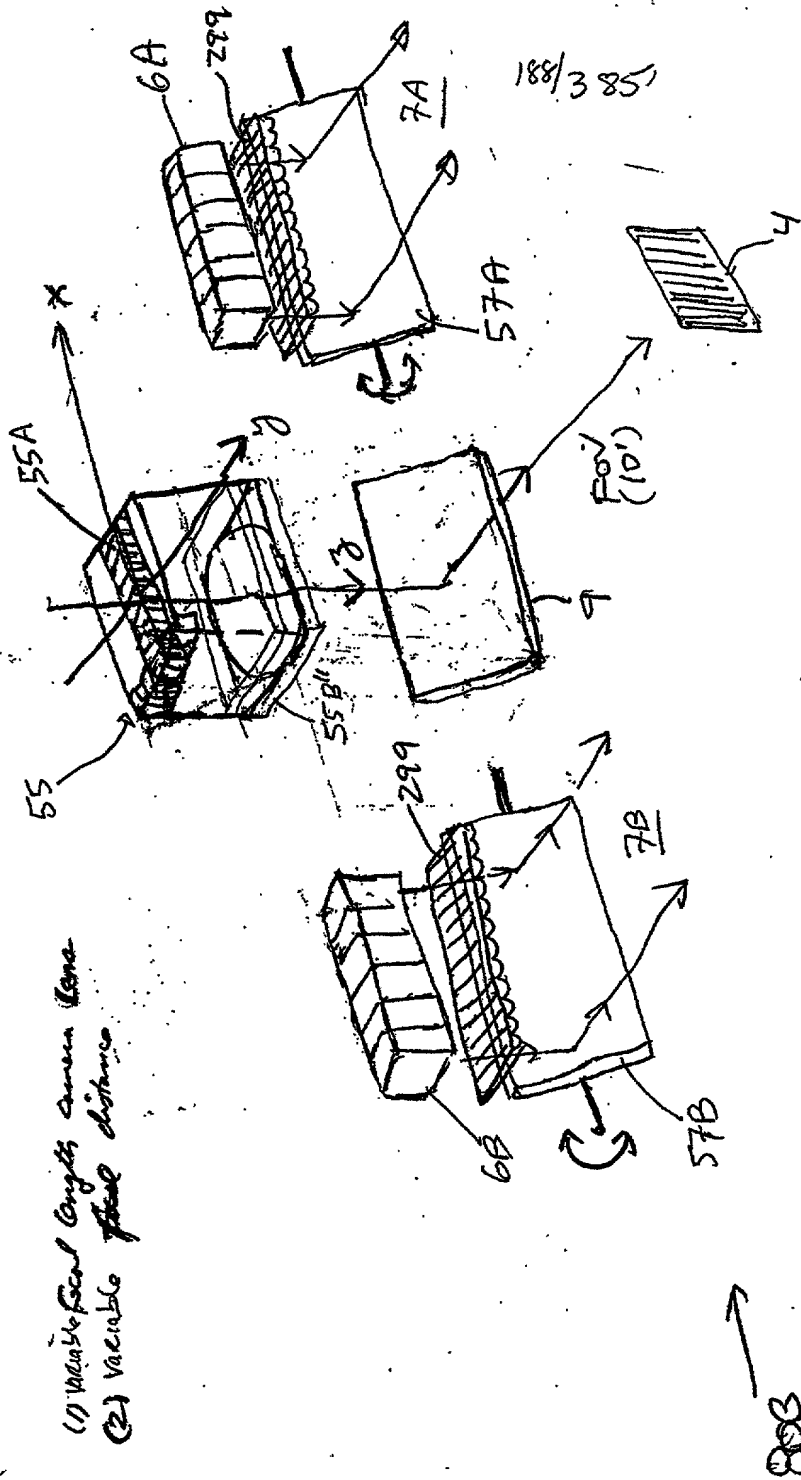
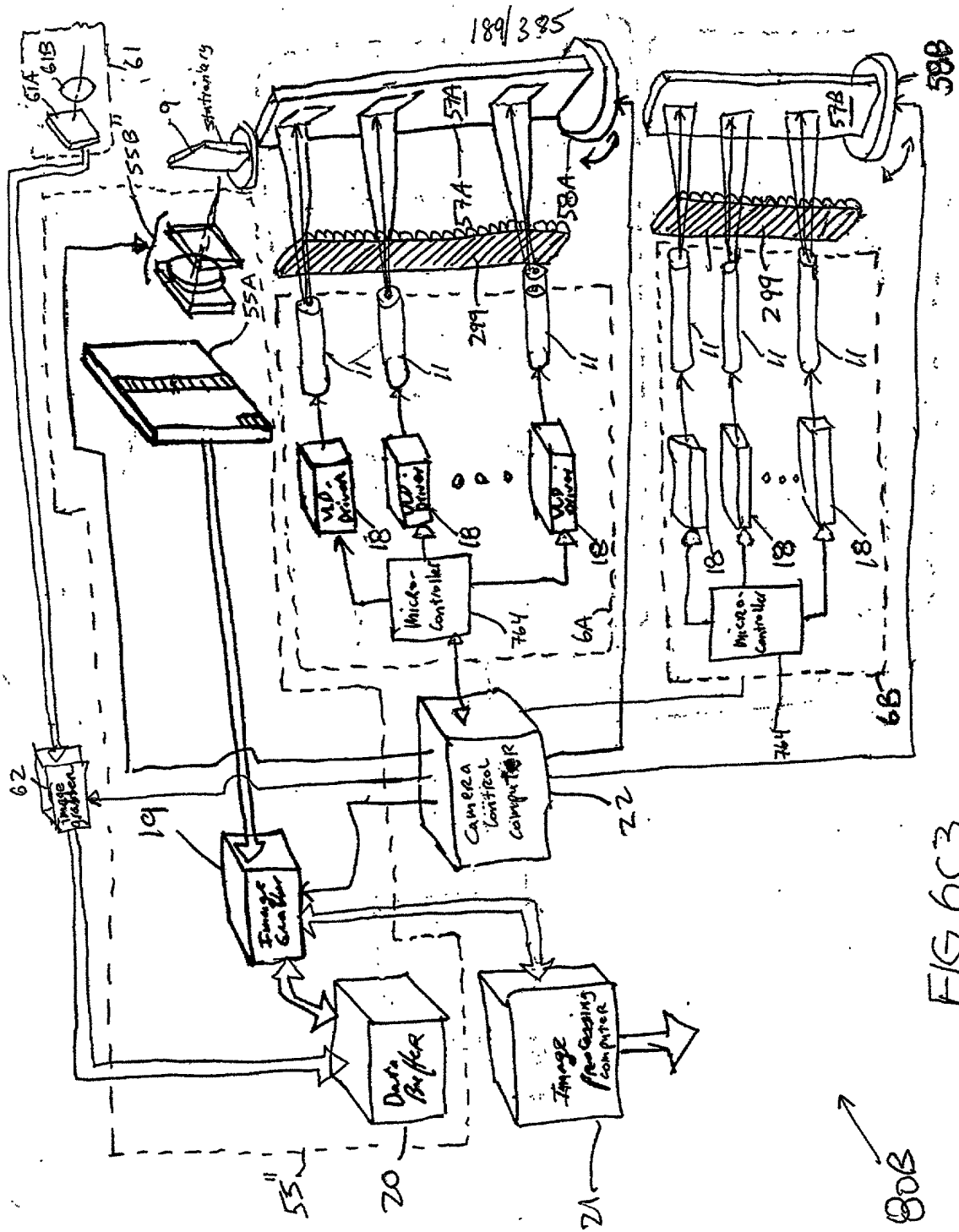


FIG. 6C2

(1) variable focal length antenna lens  
(2) variable feed distance





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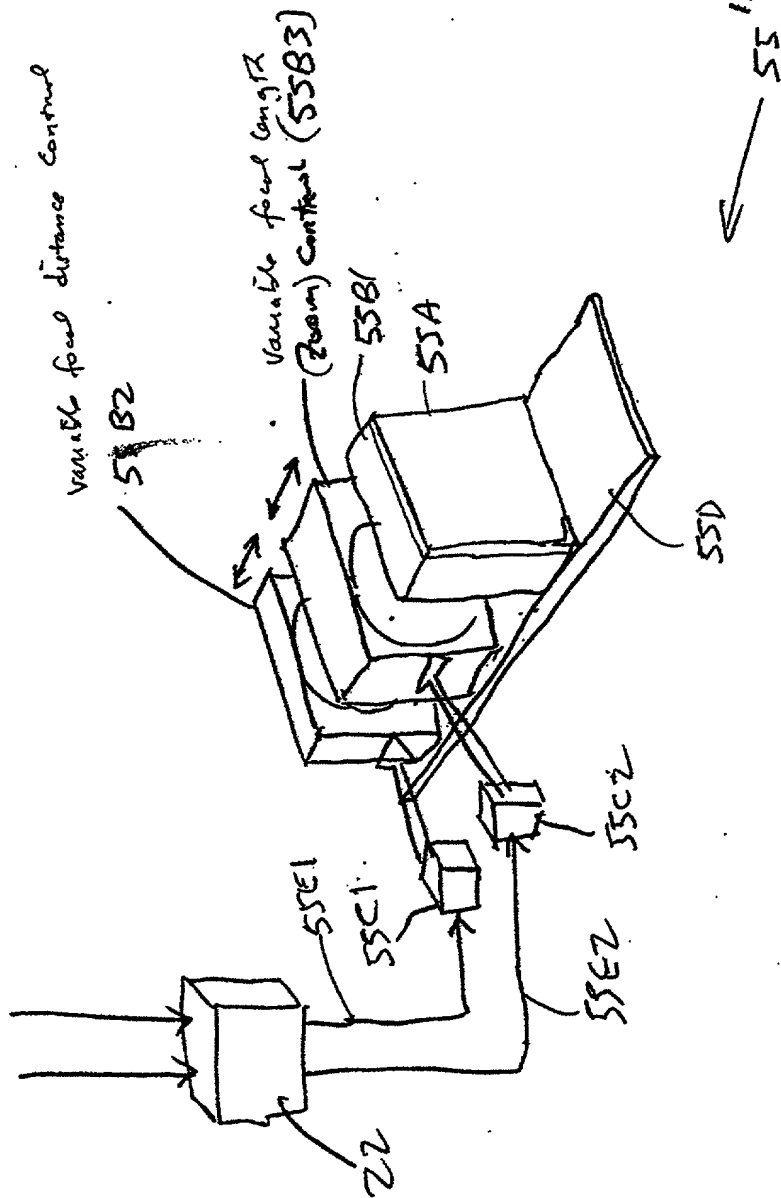


FIG. 6C4

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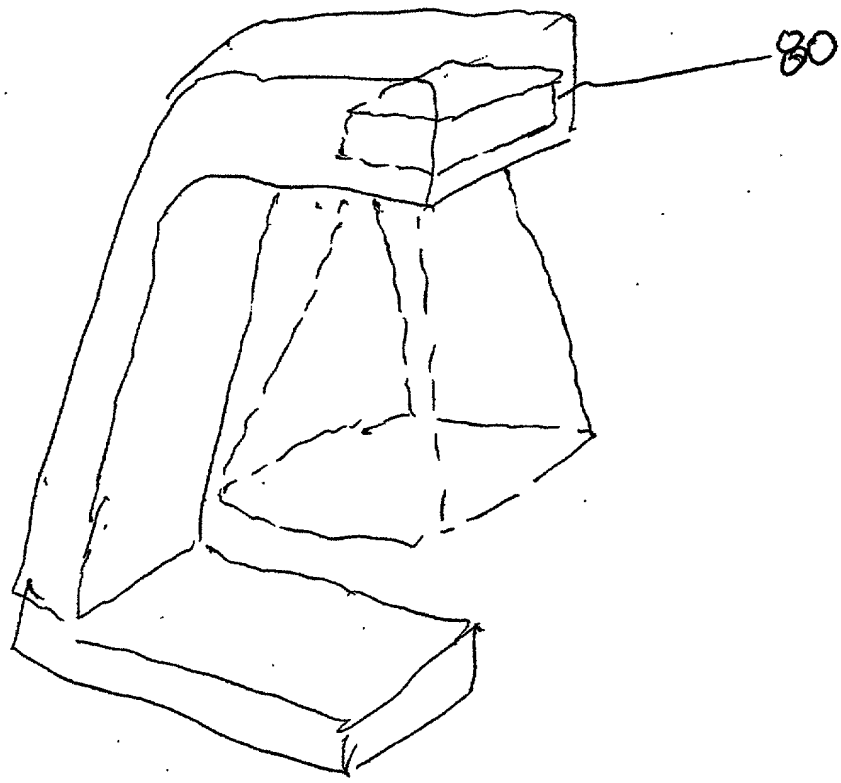
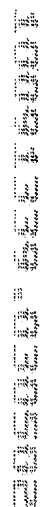


FIG. 6C5



姓名	性别	年龄	籍贯	职业	住址	电话	备注
王德胜	男	45	山东	教师	北京路123号	1234	
李小红	女	32	江苏	医生	文化路45号	5678	
张志强	男	28	河南	工程师	建设路78号	9012	
刘小芳	女	25	四川	护士	健康路34号	3456	
陈大明	男	50	广东	商人	商业路67号	7890	
赵小华	女	38	浙江	会计	财务路90号	0123	
孙伟	男	42	湖北	工人	工业路23号	4567	
周丽	女	35	湖南	记者	新闻路56号	8901	
吴刚	男	30	安徽	程序员	科技路89号	2345	
郑娟	女	27	江西	设计师	创意路12号	6789	
冯伟	男	40	福建	农民	农村路45号	0123	
黄小梅	女	33	广西	教师	教育路78号	4567	
徐强	男	37	贵州	商人	商业路90号	8901	
曹小华	女	29	云南	护士	健康路23号	2345	
林大明	男	48	陕西	工人	工业路56号	6789	
周丽	女	36	甘肃	记者	新闻路89号	0123	
吴刚	男	31	宁夏	程序员	科技路12号	4567	
郑娟	女	26	青海	设计师	创意路45号	8901	
冯伟	男	41	海南	农民	农村路78号	2345	
黄小梅	女	34	重庆	教师	教育路90号	6789	
徐强	男	39	四川	商人	商业路23号	0123	
曹小华	女	30	湖南	护士	健康路56号	4567	
林大明	男	49	湖北	工人	工业路89号	8901	
周丽	女	37	河南	记者	新闻路12号	2345	
吴刚	男	32	山东	程序员	科技路45号	6789	
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曹小华	女	31	福建	护士	健康路89号	6789	
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吴刚	男	35	贵州	程序员	科技路23号	2345	
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林大明	男	53	湖北	工人	工业路90号	6789	
周丽	女	41	河南	记者	新闻路23号	0123	
吴刚	男	36	山东	程序员	科技路56号	4567	
郑娟							



姓名	性别	年龄	籍贯	职业	住址	电话	备注
王德胜	男	45	山东	教师	北京路123号	1234	
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吴刚	男	30	安徽	程序员	科技路89号	2345	
郑娟	女	27	江西	设计师	创意路12号	6789	
冯伟	男	40	福建	农民	农村路45号	0123	
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徐强	男	37	贵州	商人	商业路90号	8901	
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吴刚	男	31	宁夏	程序员	科技路12号	4567	
郑娟	女	26	青海	设计师	创意路45号	8901	
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林大明	男	53	湖北	工人	工业路90号	6789	
周丽	女	41	河南	记者	新闻路23号	0123	
吴刚	男	36	山东	程序员	科技路56号	4567	
郑娟							

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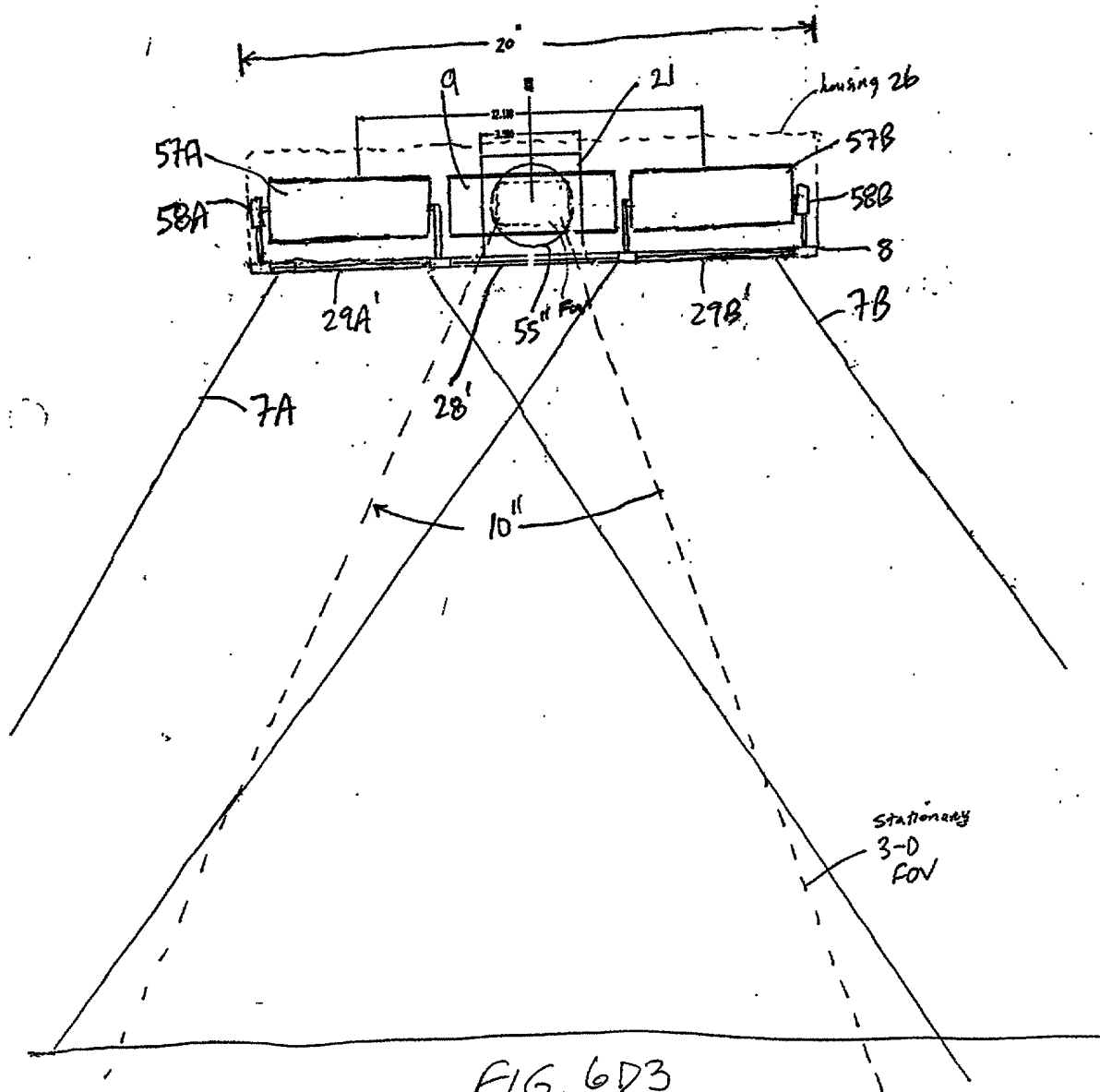


FIG. 6D3

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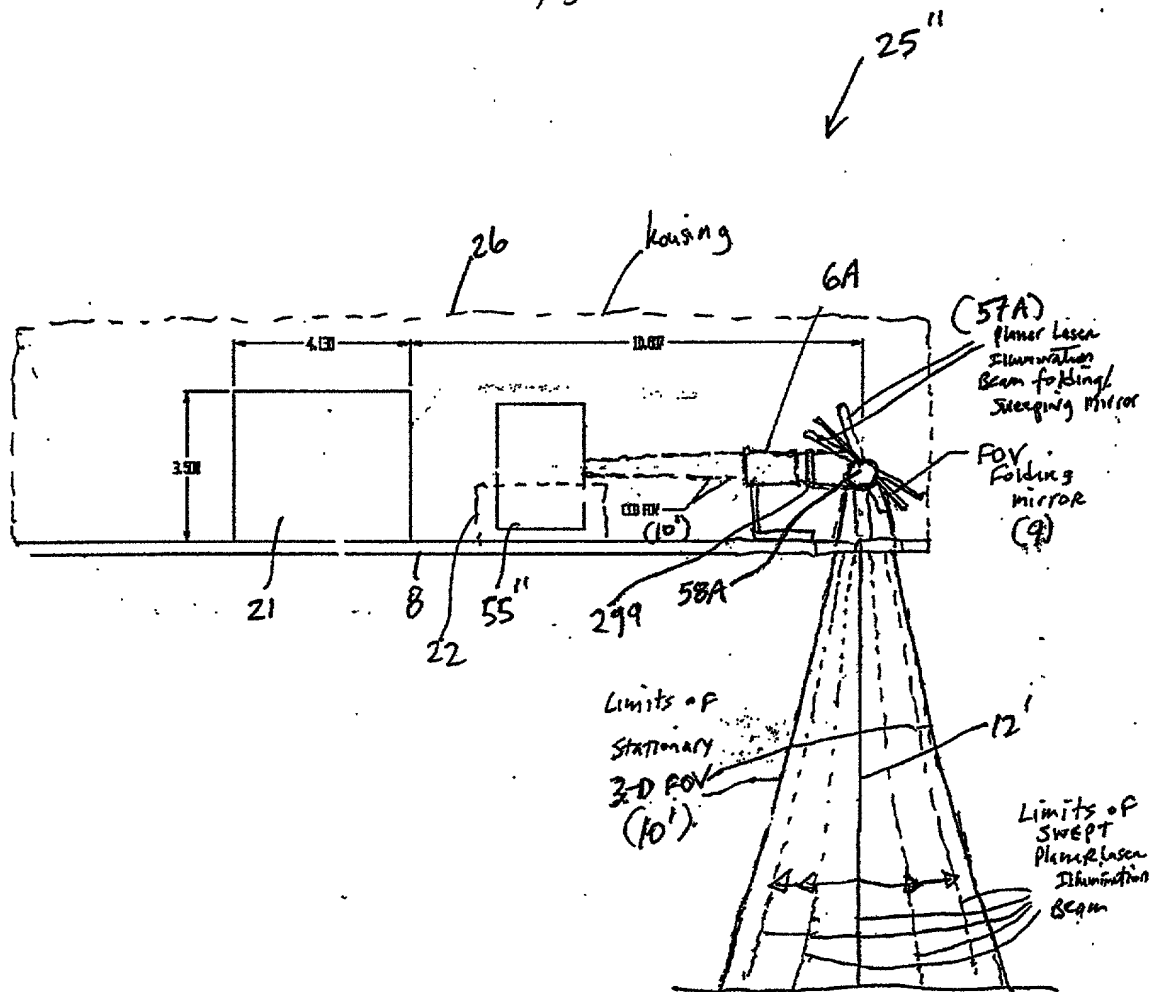


FIG. 6D4

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Variable FOV

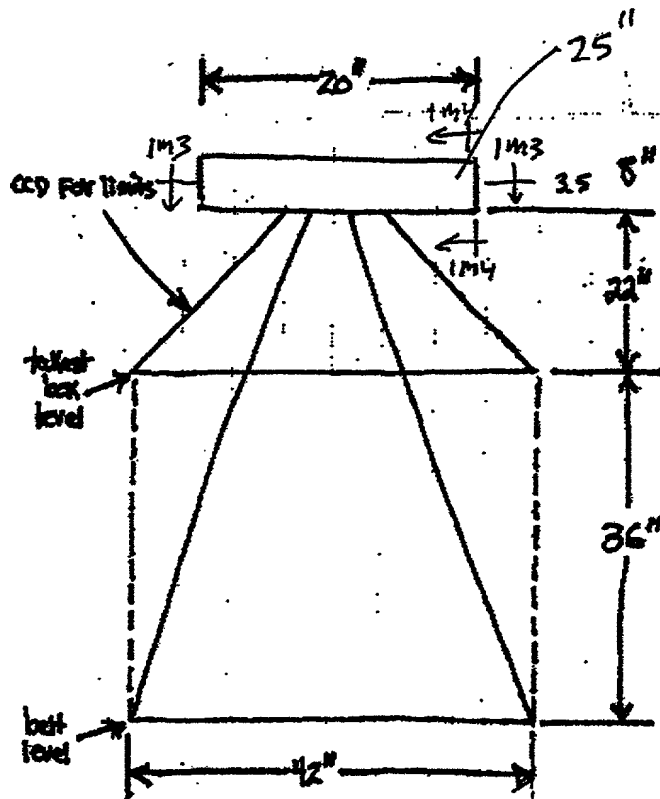


FIG. 6D5



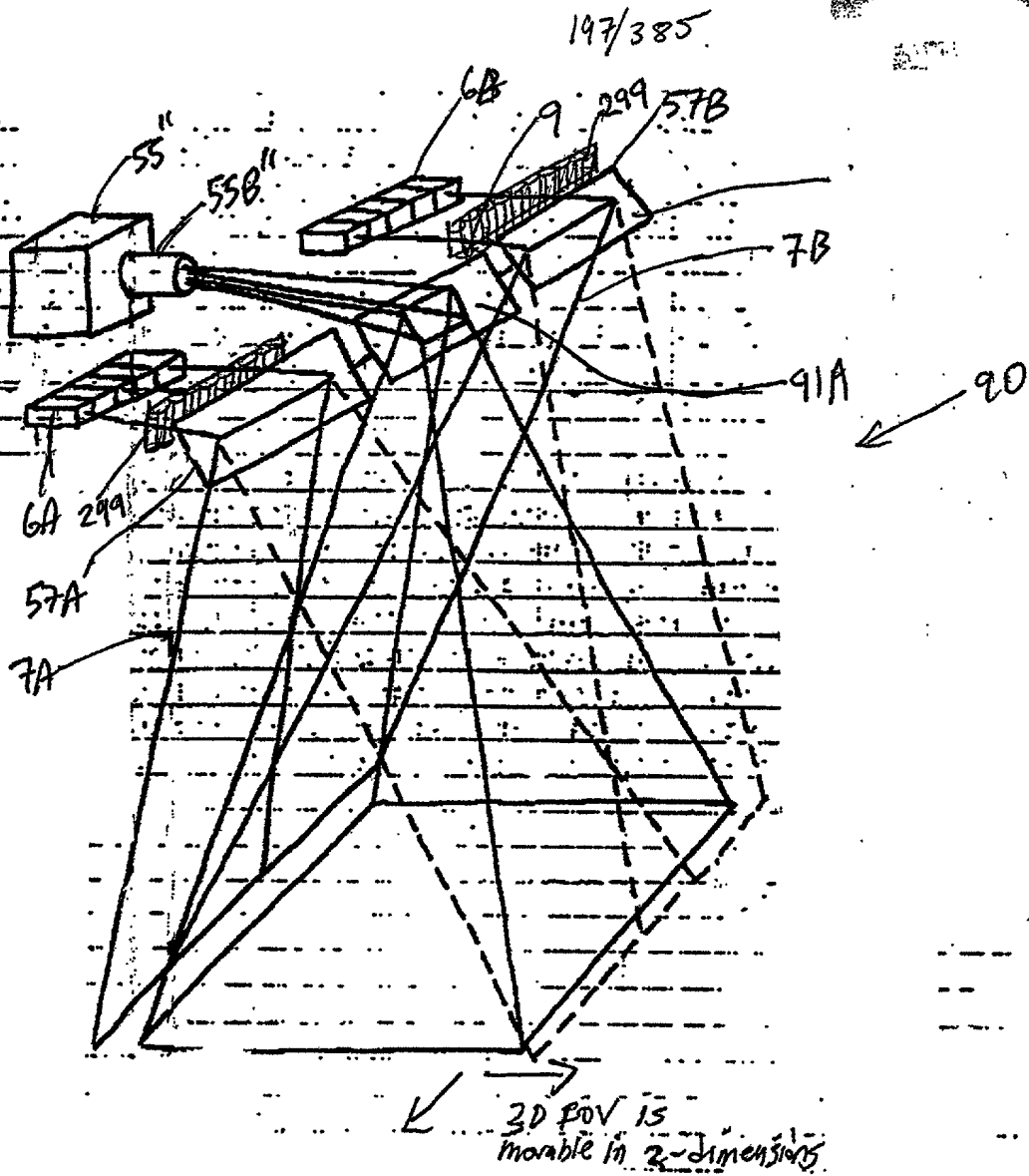
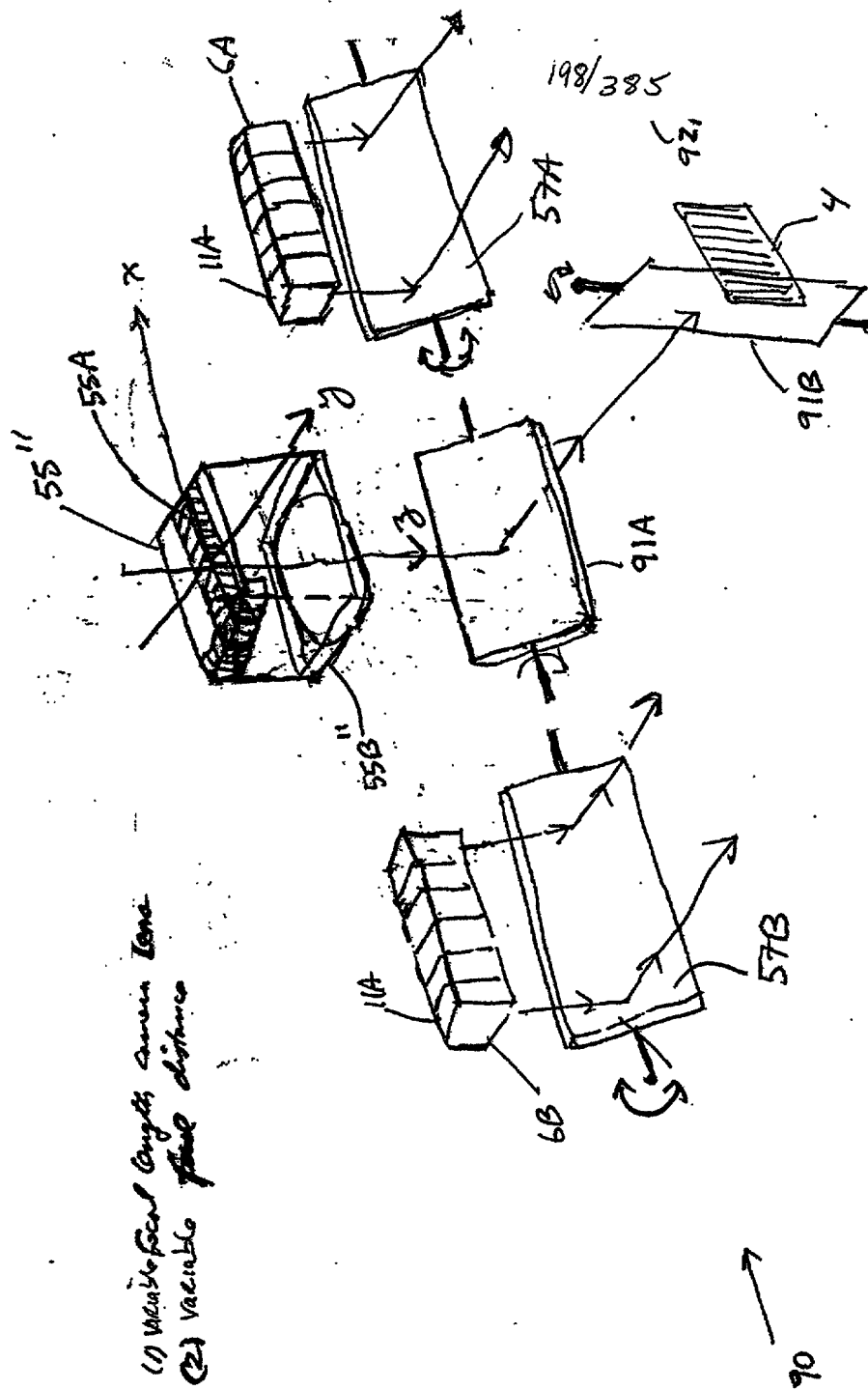


FIG 6E1



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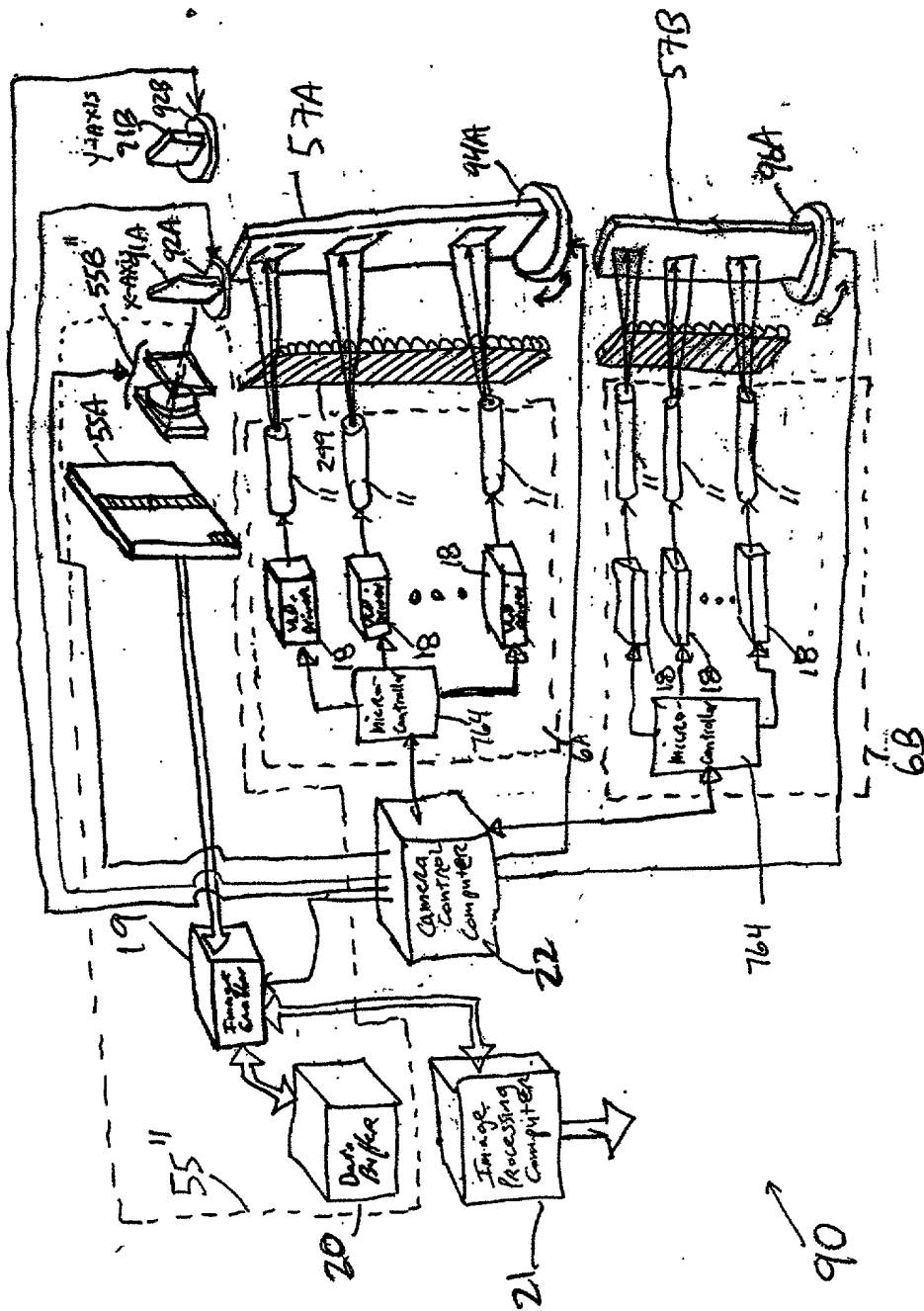
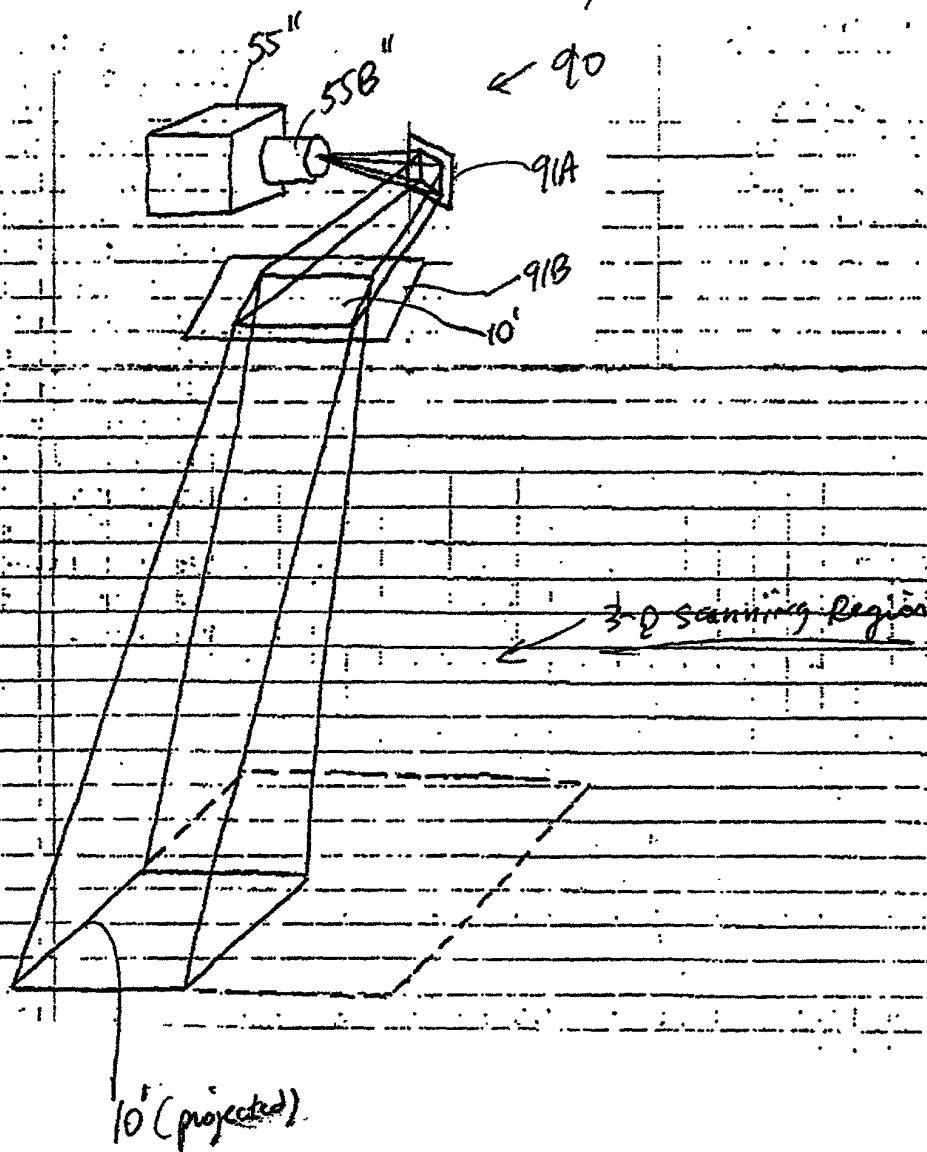


FIG. 6E3

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— FIG. 6E4

20110101 00:00:00

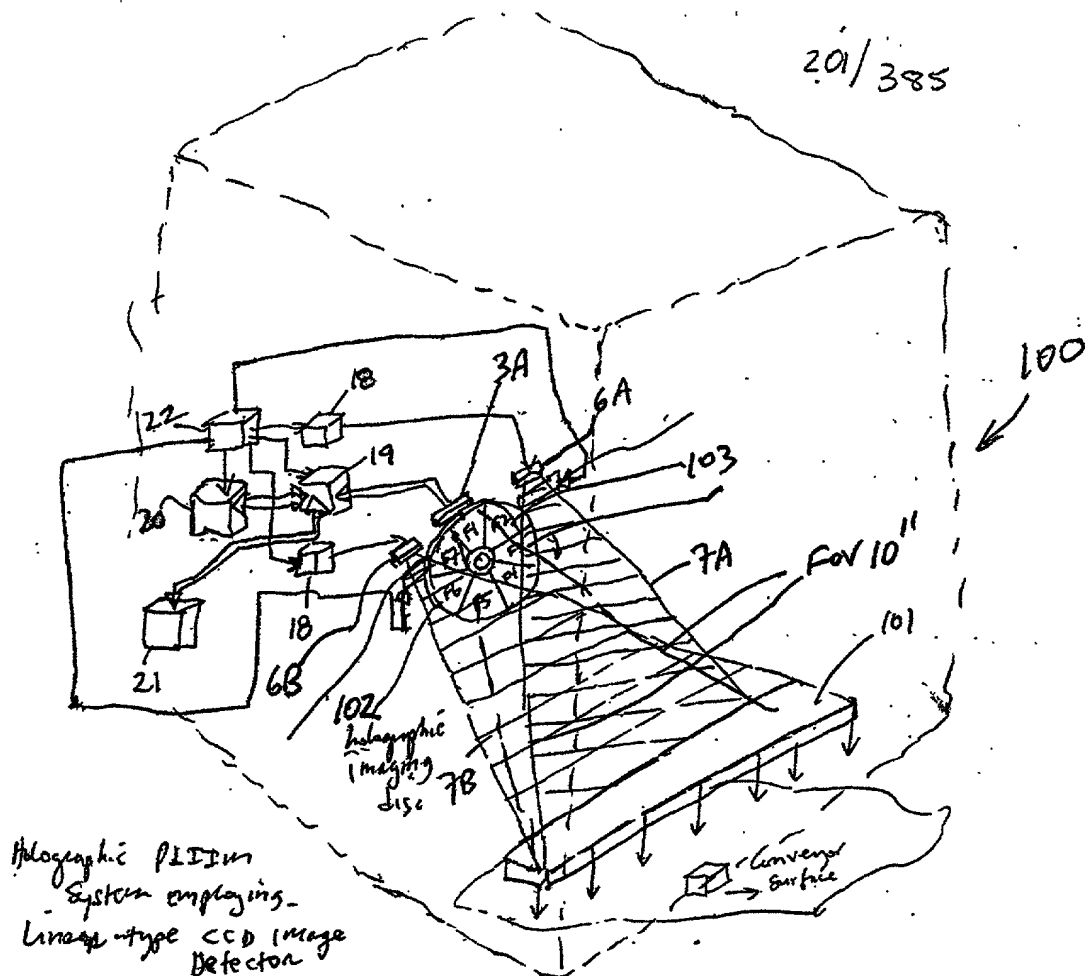


FIG. 7A

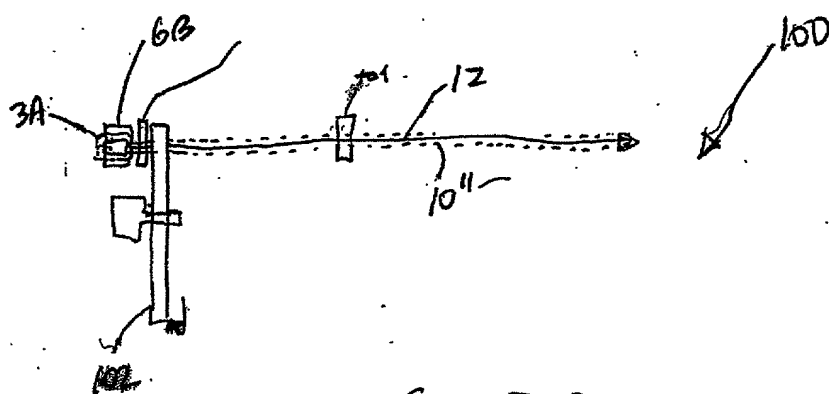
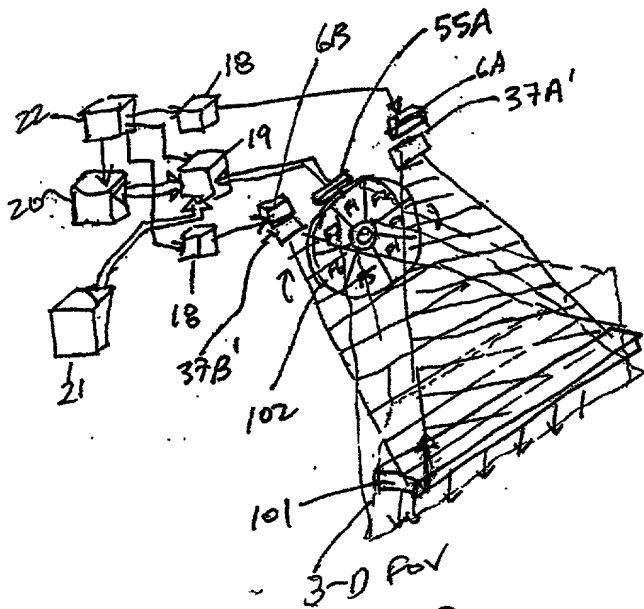


FIG. 7B

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Holographic PLI system employing  
Area-Type  
CCD Image  
Detector  
100

FIG. 8A

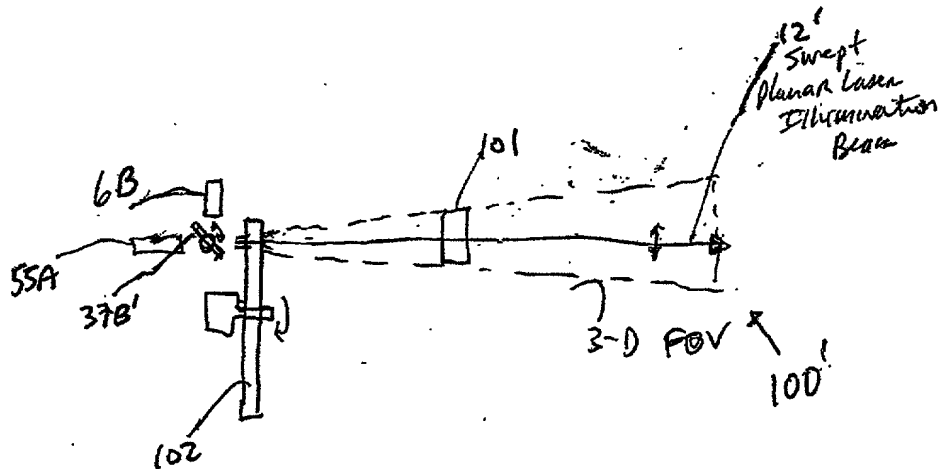


FIG. 8B

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1-D CCD SCANNER EMBODIMENT

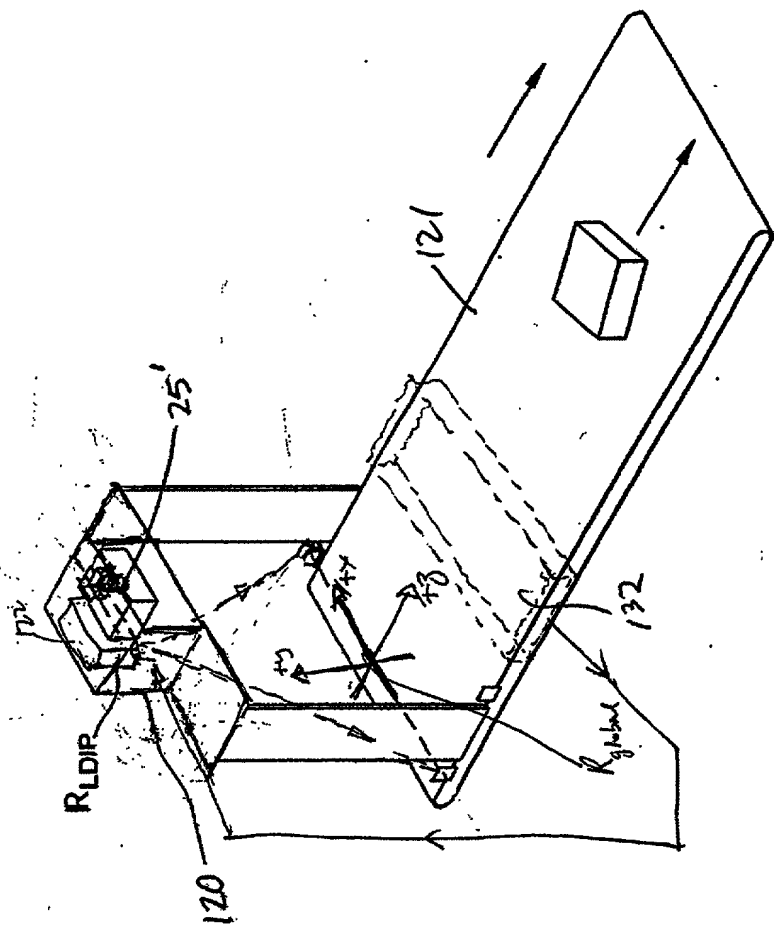


FIG. 9

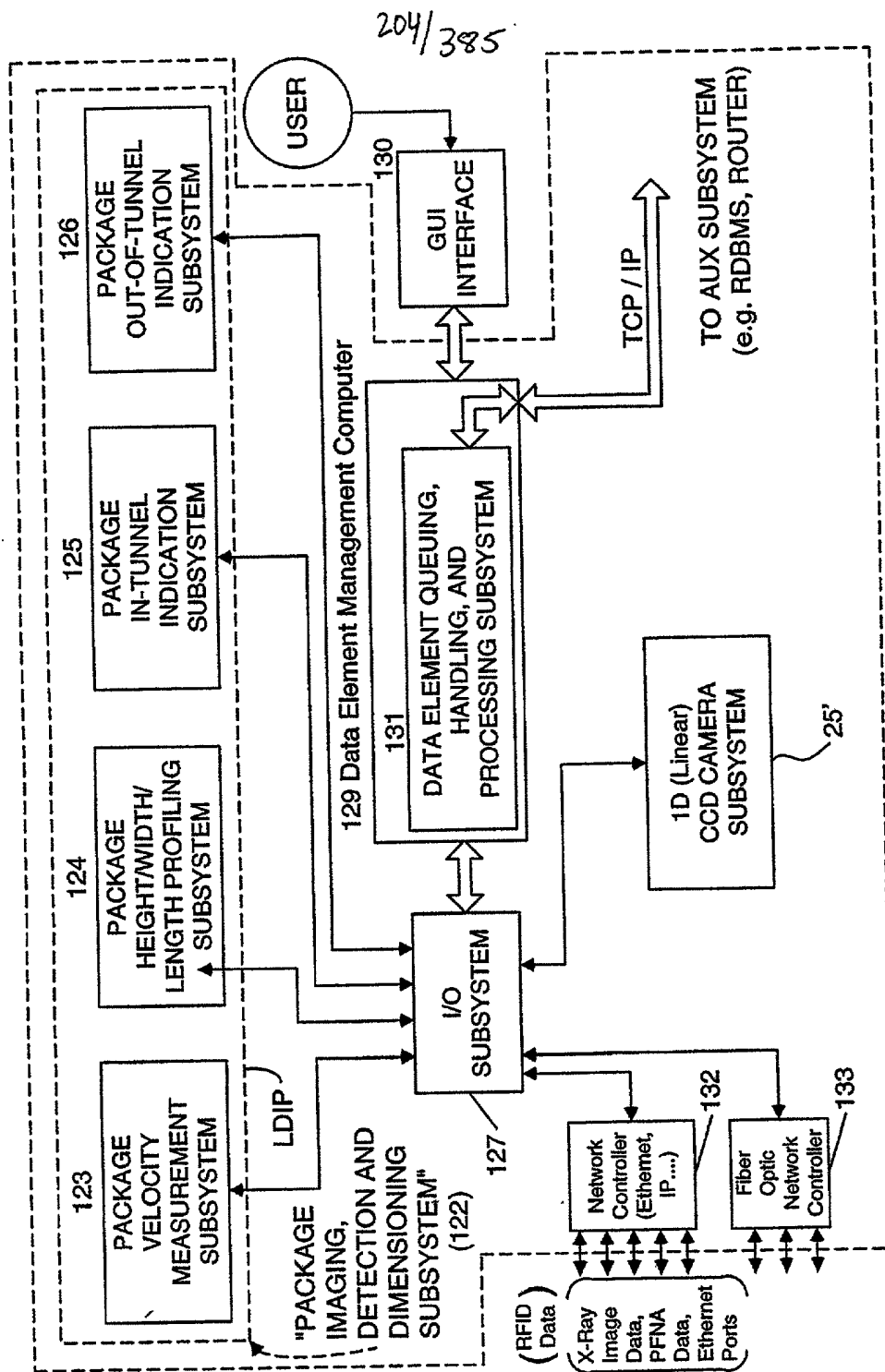


FIG. 10



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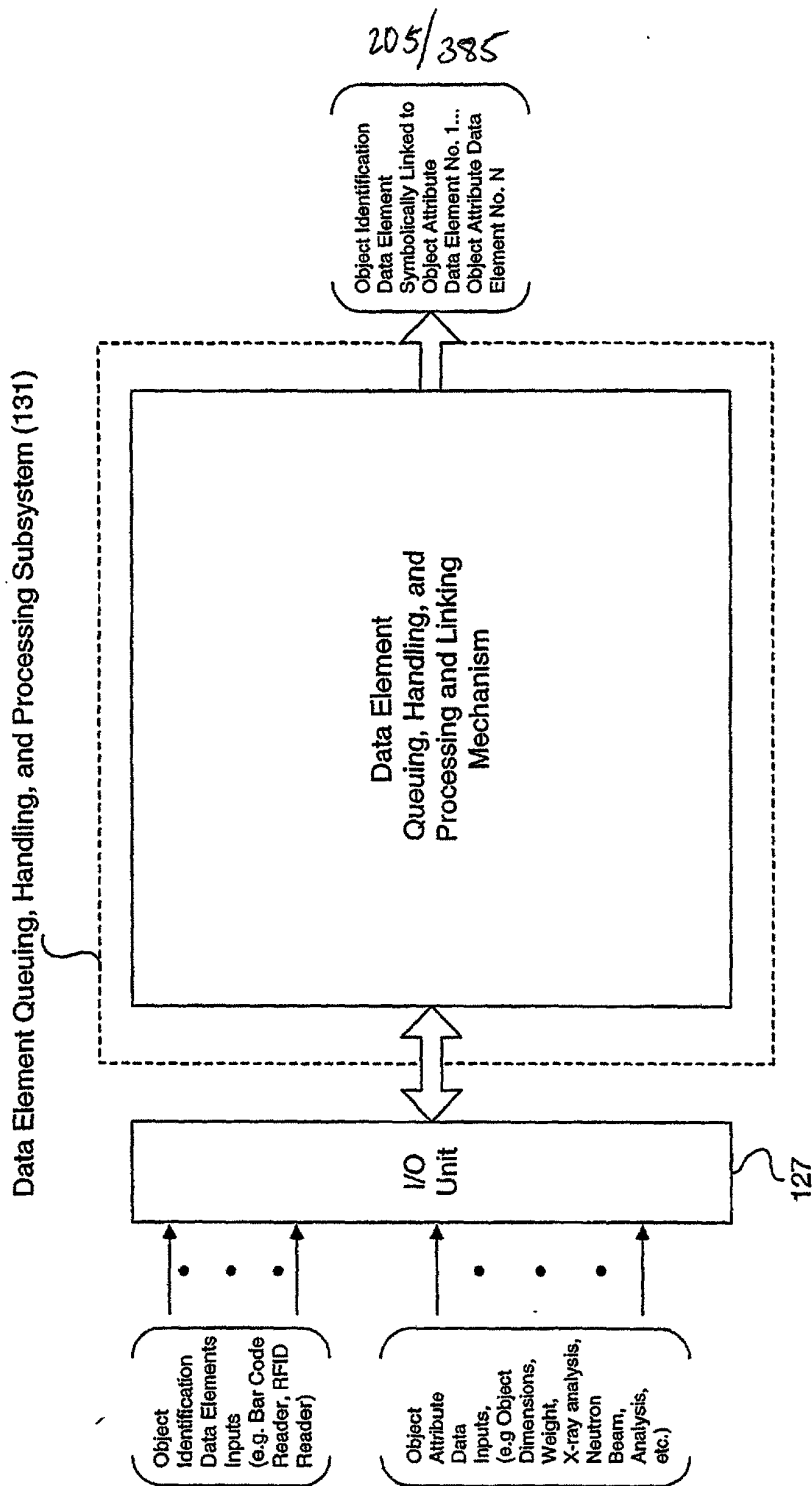
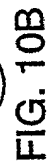


FIG. 10A

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- C. Specification of Object Attribute Acquisition Capability of System**



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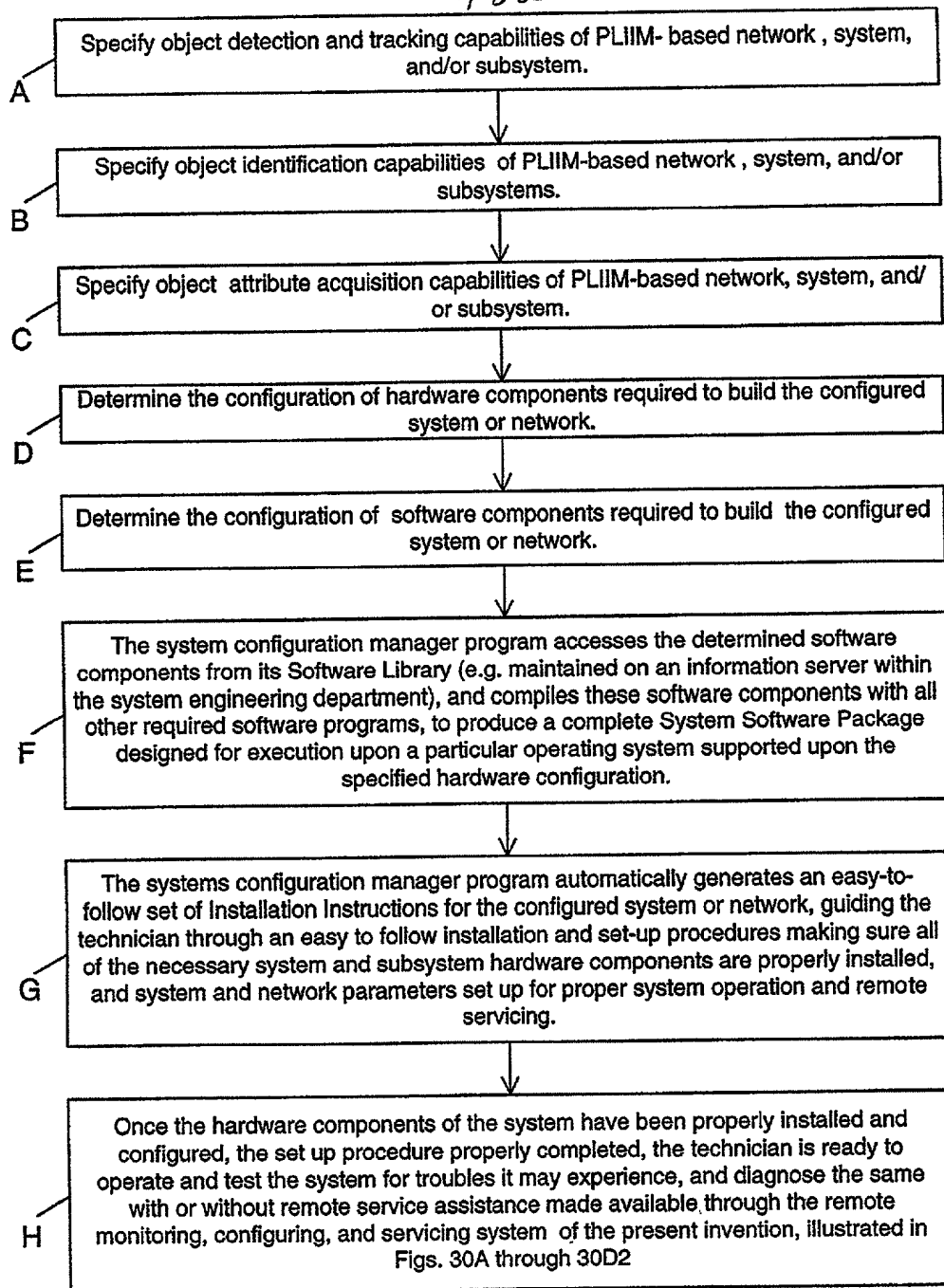


FIG. 10C

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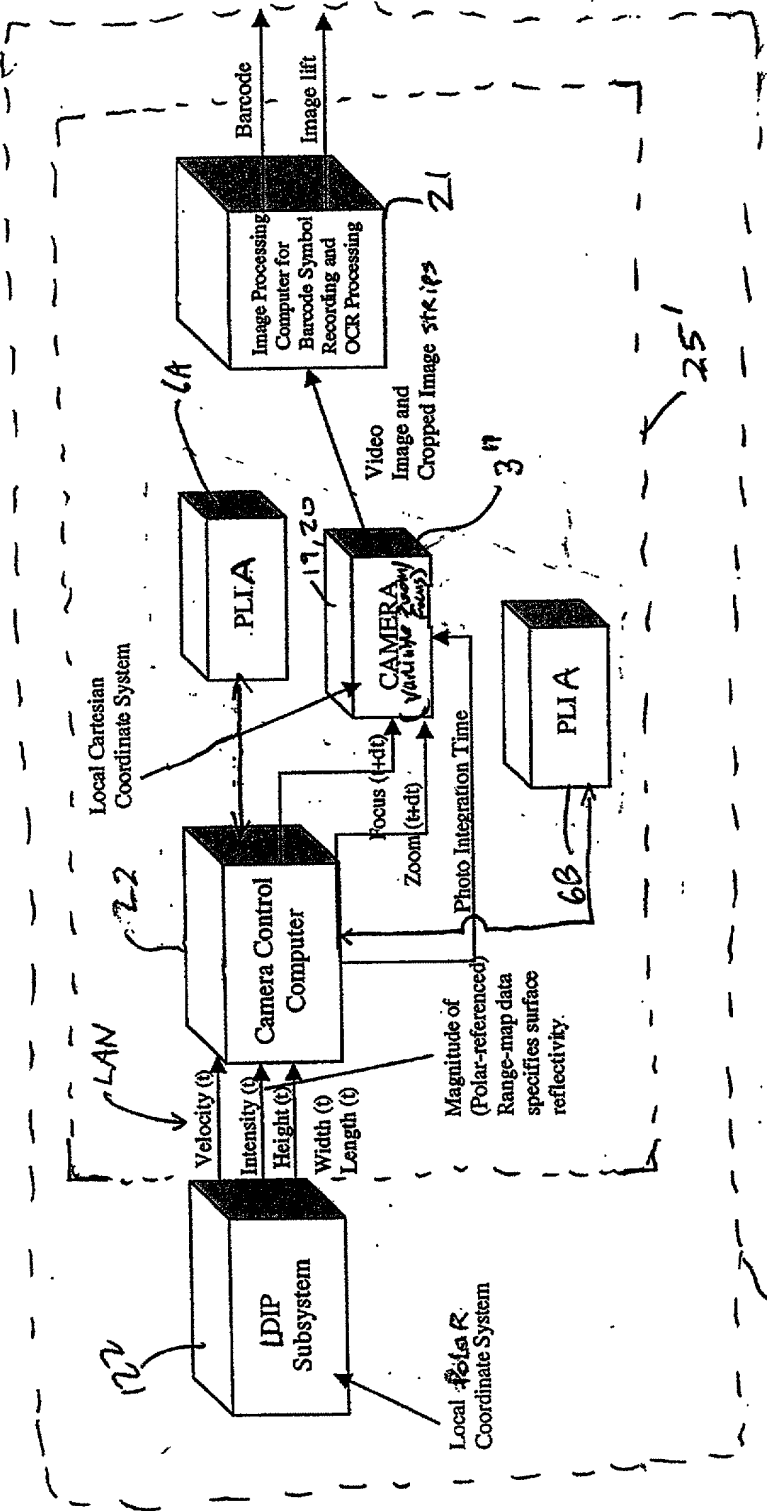
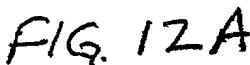


FIG. 11

[illegible]

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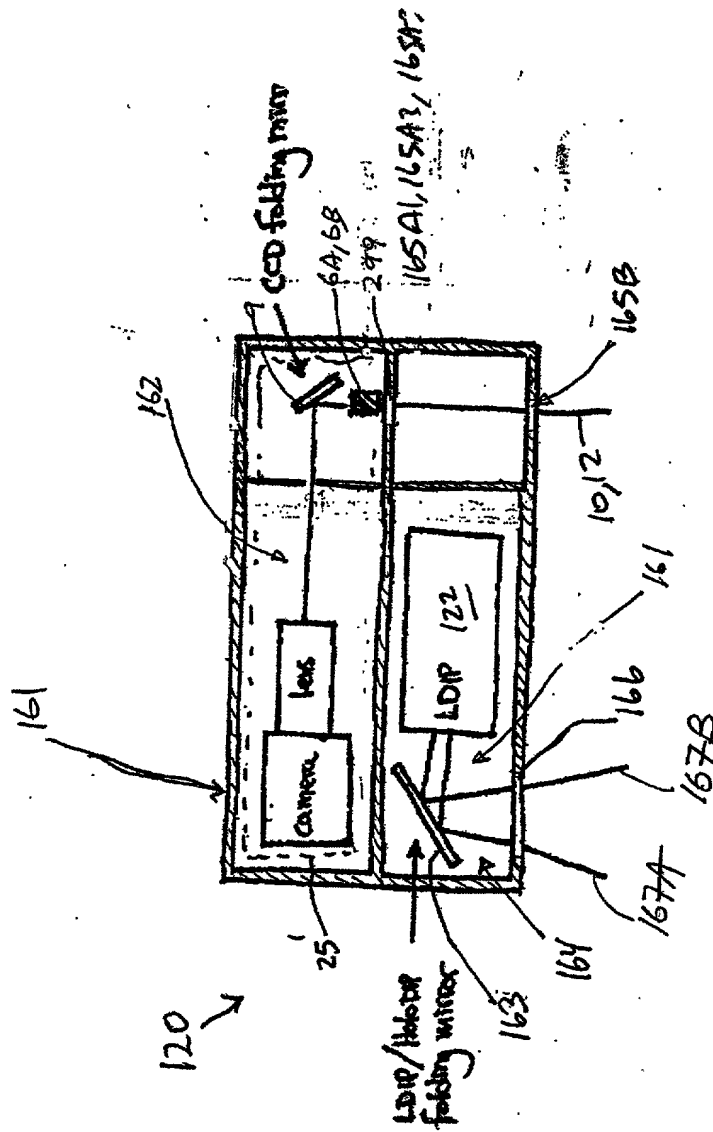


FIG. 12B

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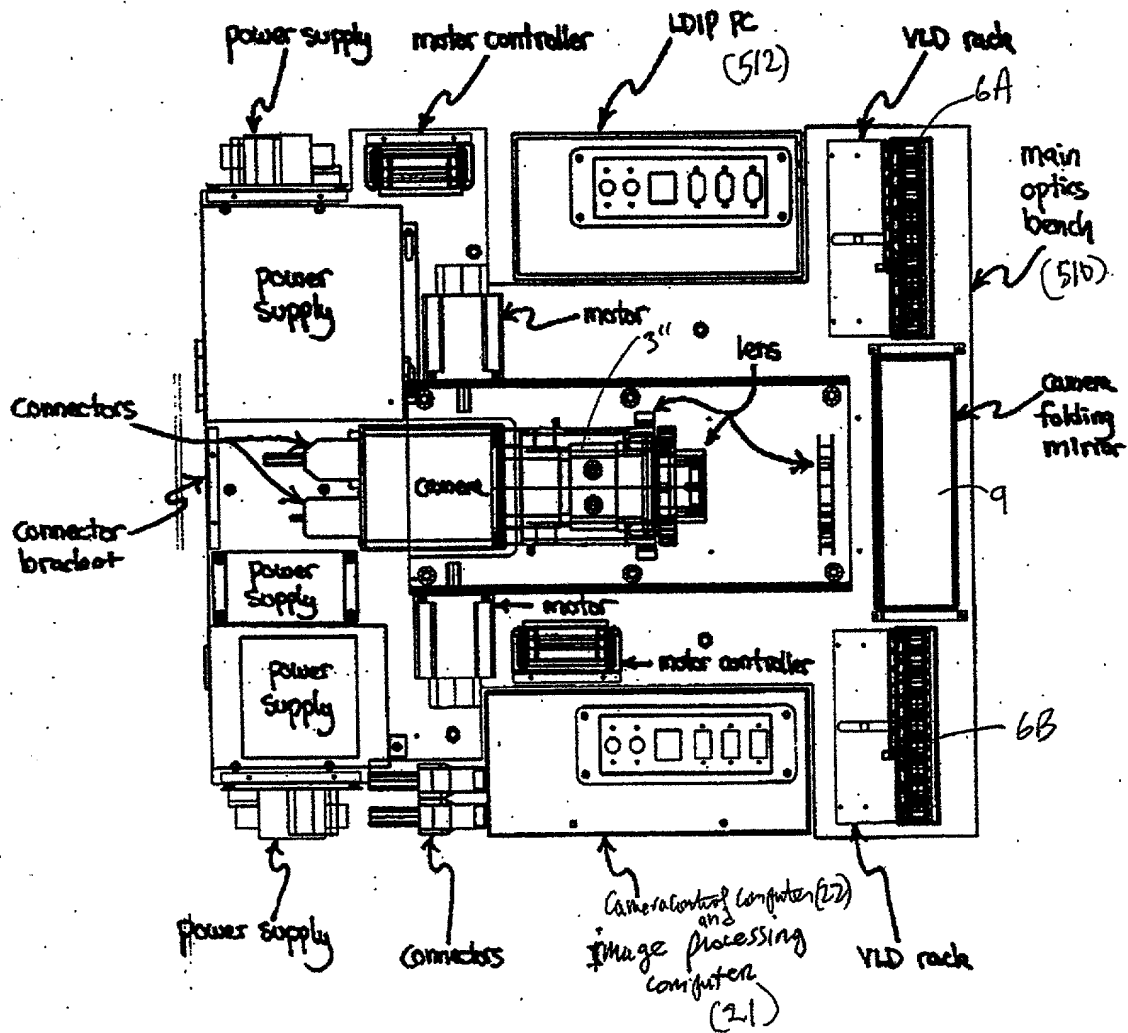


FIG. 12C

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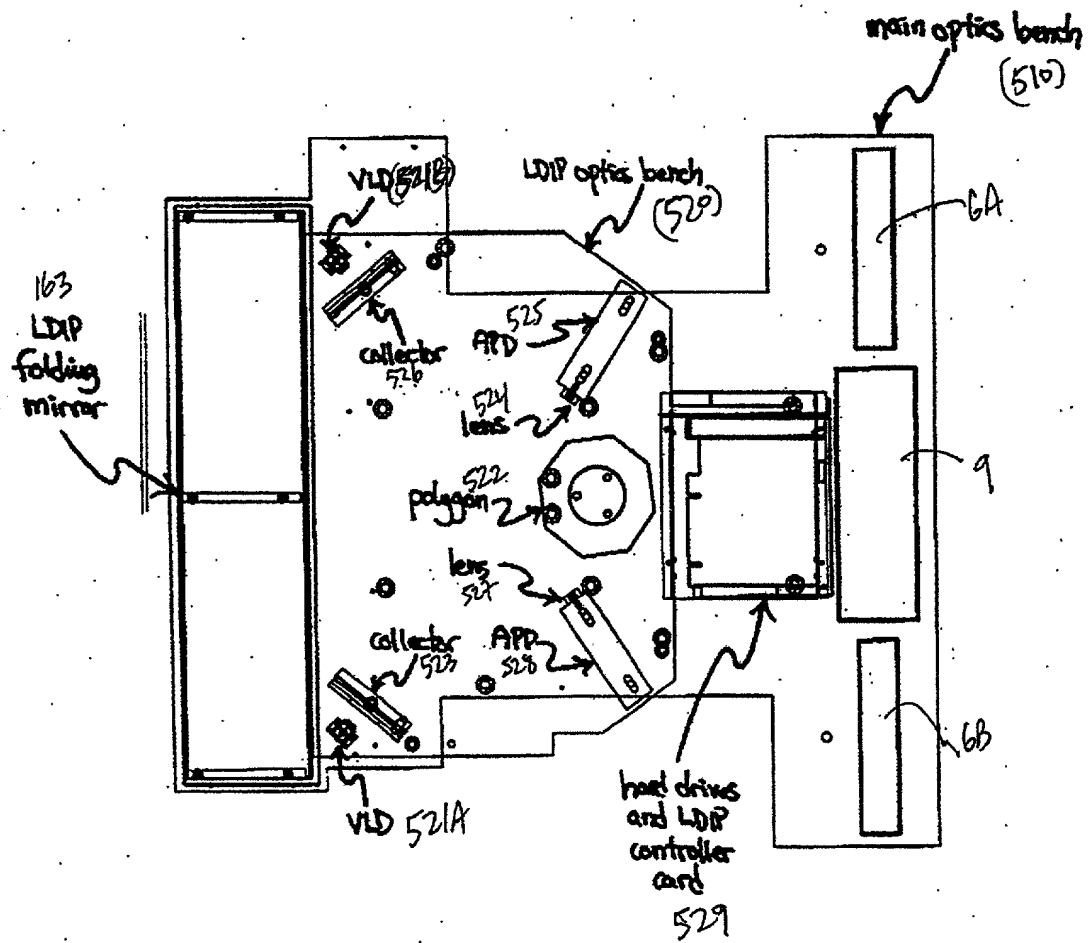
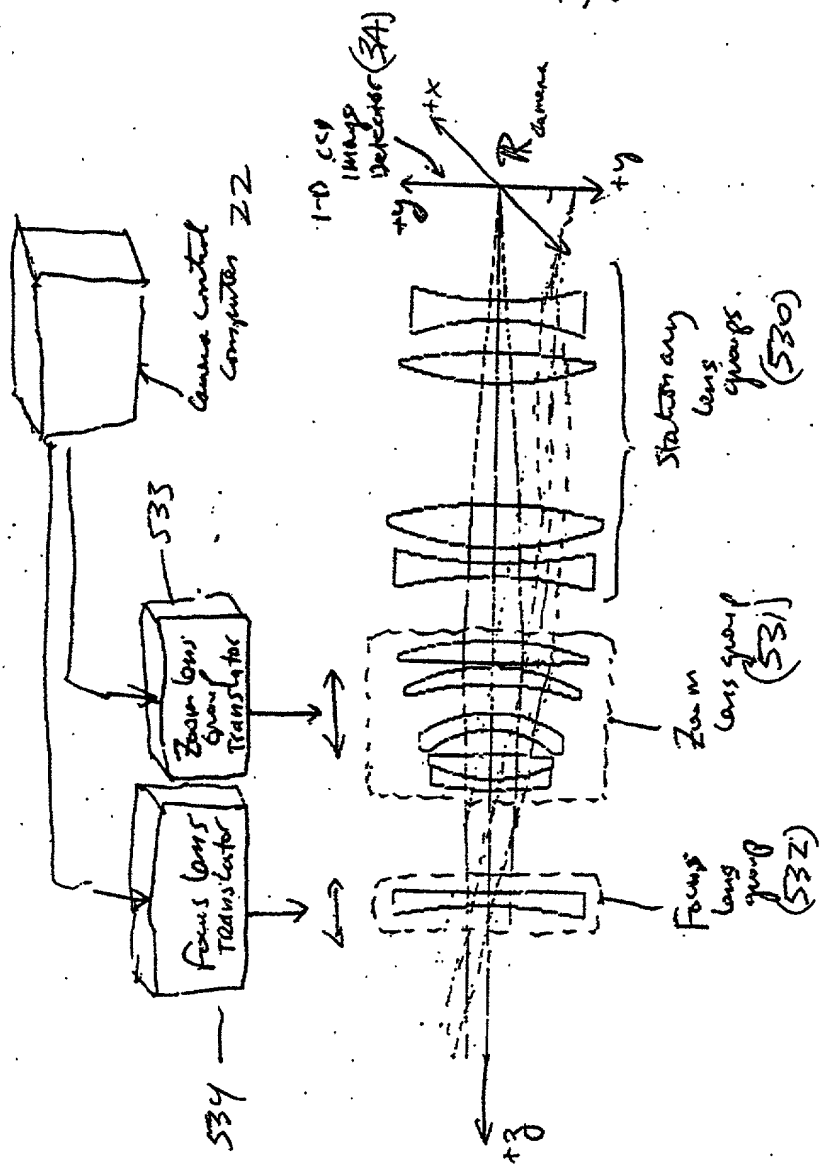


FIG. 12D



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(main optics)  
(Lens groups)

FIG. 12E

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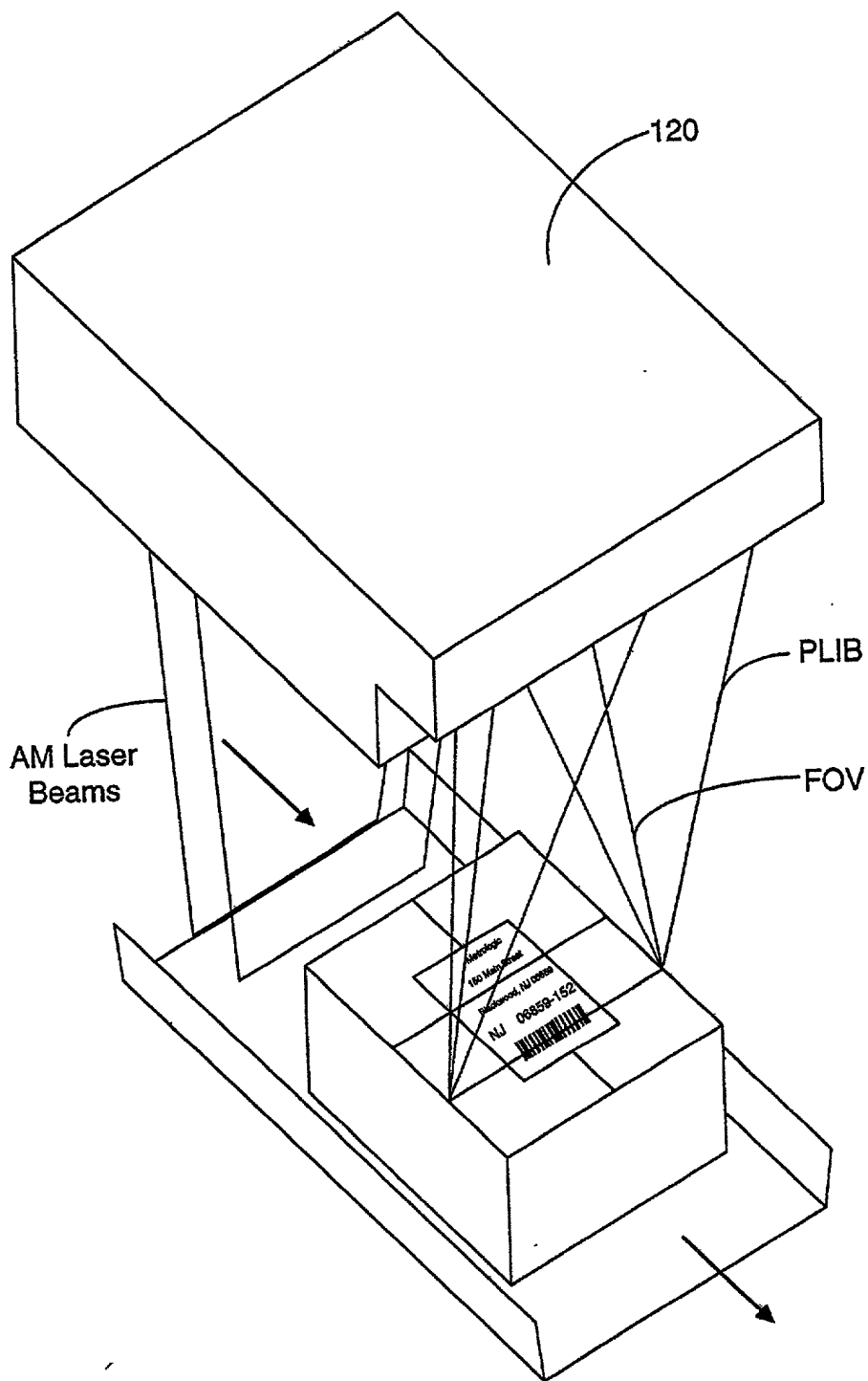


FIG. 13A

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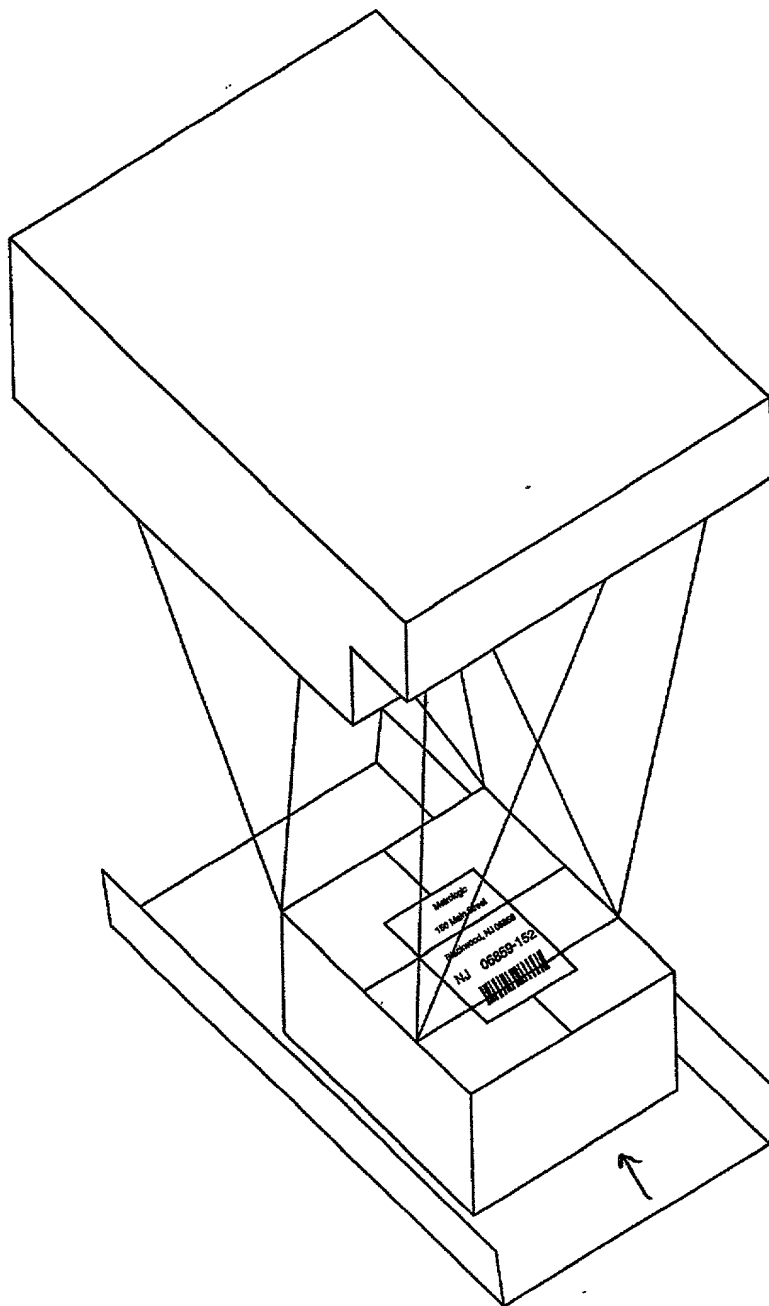


FIG. 13A

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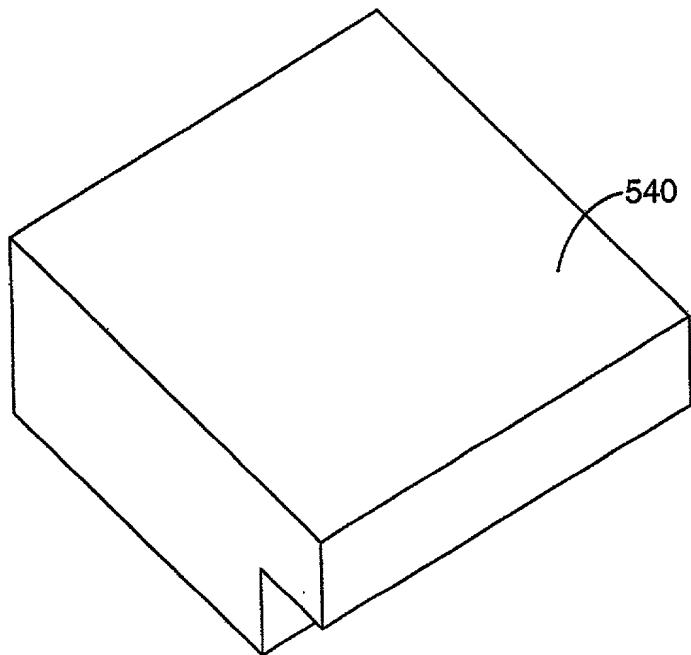


FIG. 13B

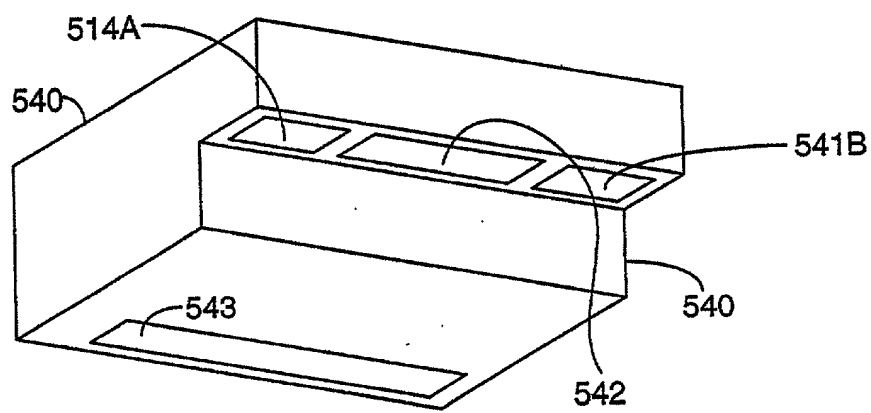


FIG. 13C

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PLLIM-BASED PACKAGE IDENTIFICATION AND  
DIMENSIONING (PID) SYSTEM

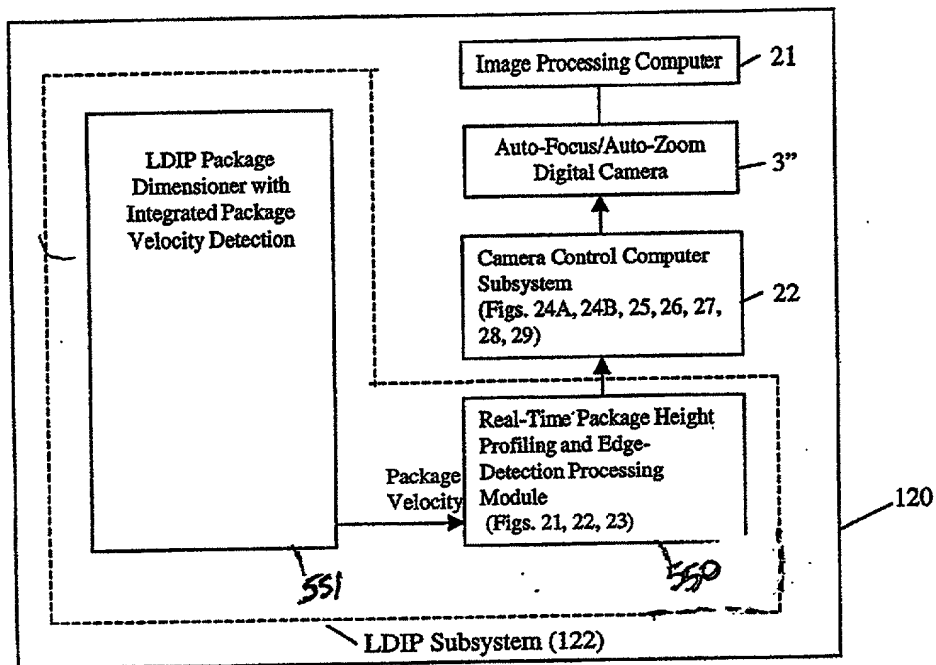


FIG. 14

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# LDIP REAL-TIME PACKAGE HEIGHT PROFILE AND EDGE DETECTION METHOD

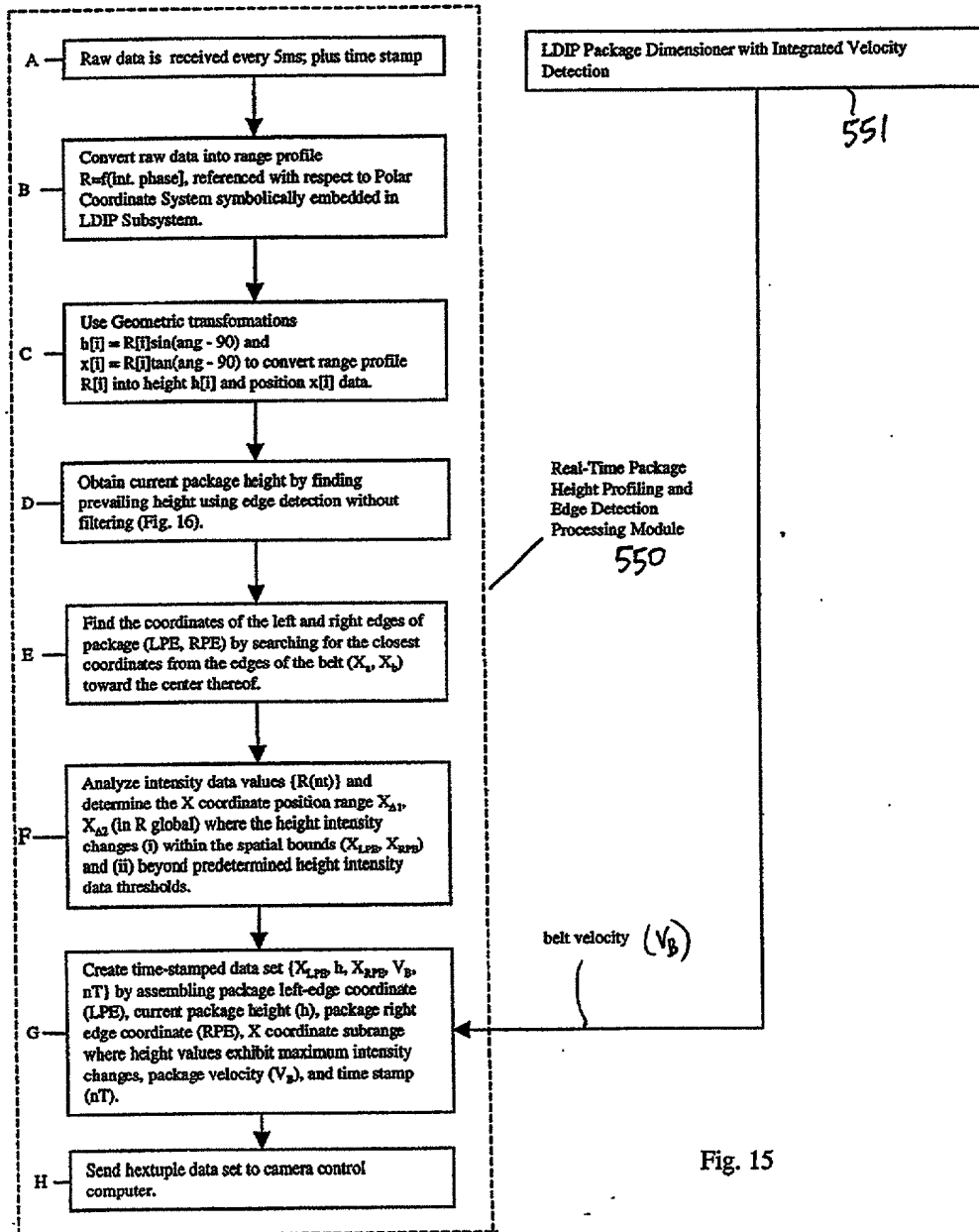
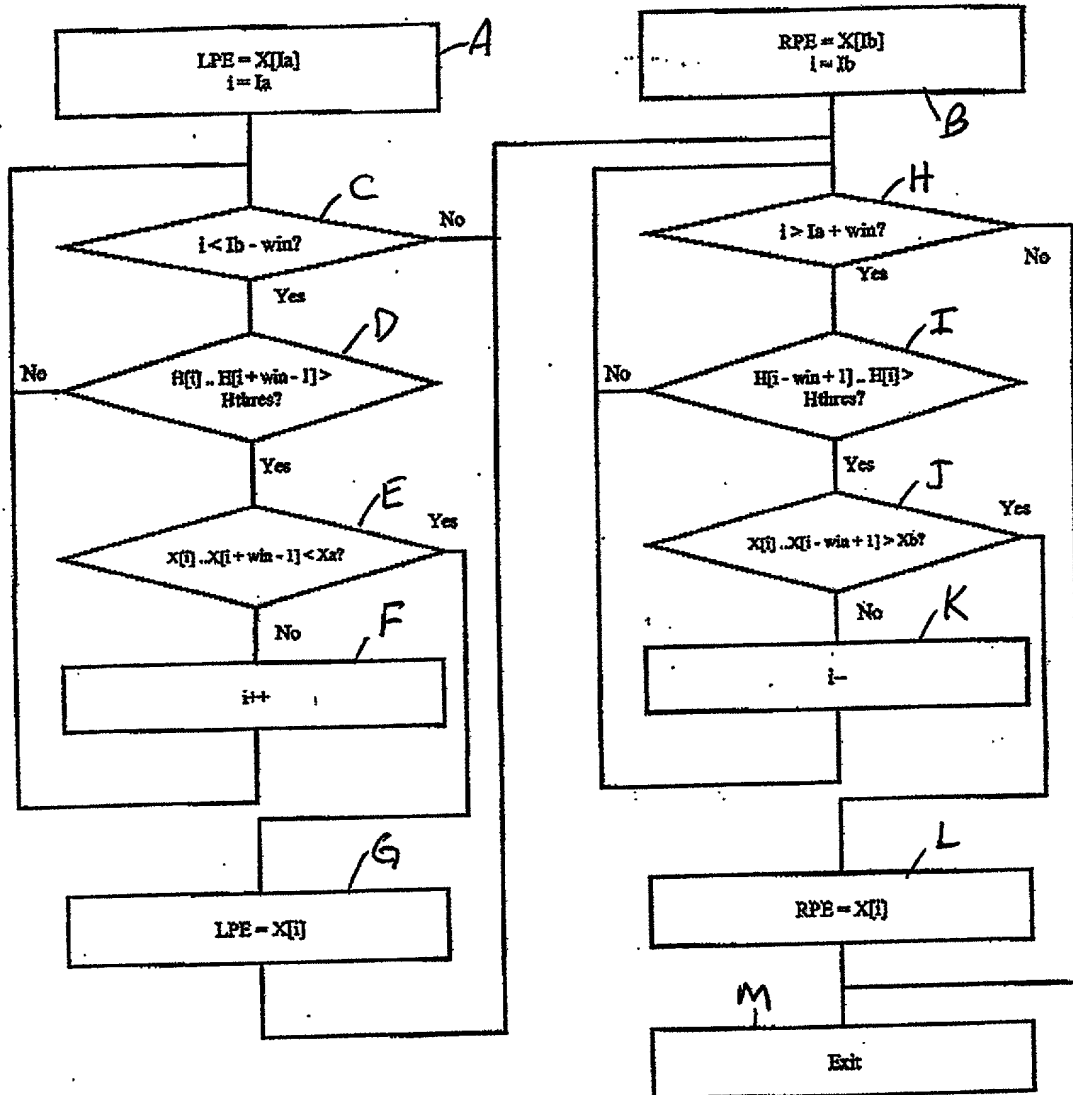


Fig. 15

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# LDIP Real Time Package Edge Detection



$X_a$  = location of belt left edge;  $X_b$  = location of belt right edge  
 $I_a$  = belt edge edge pixel;  $I_b$  = belt right edge pixel  
 $LPE$  = Left package edge;  $RPE$  = Right package edge  
 $H[]$  = Pixel height array;  $X[]$  = Pixel location array  
 $win$  = package detection window

FIG. 16

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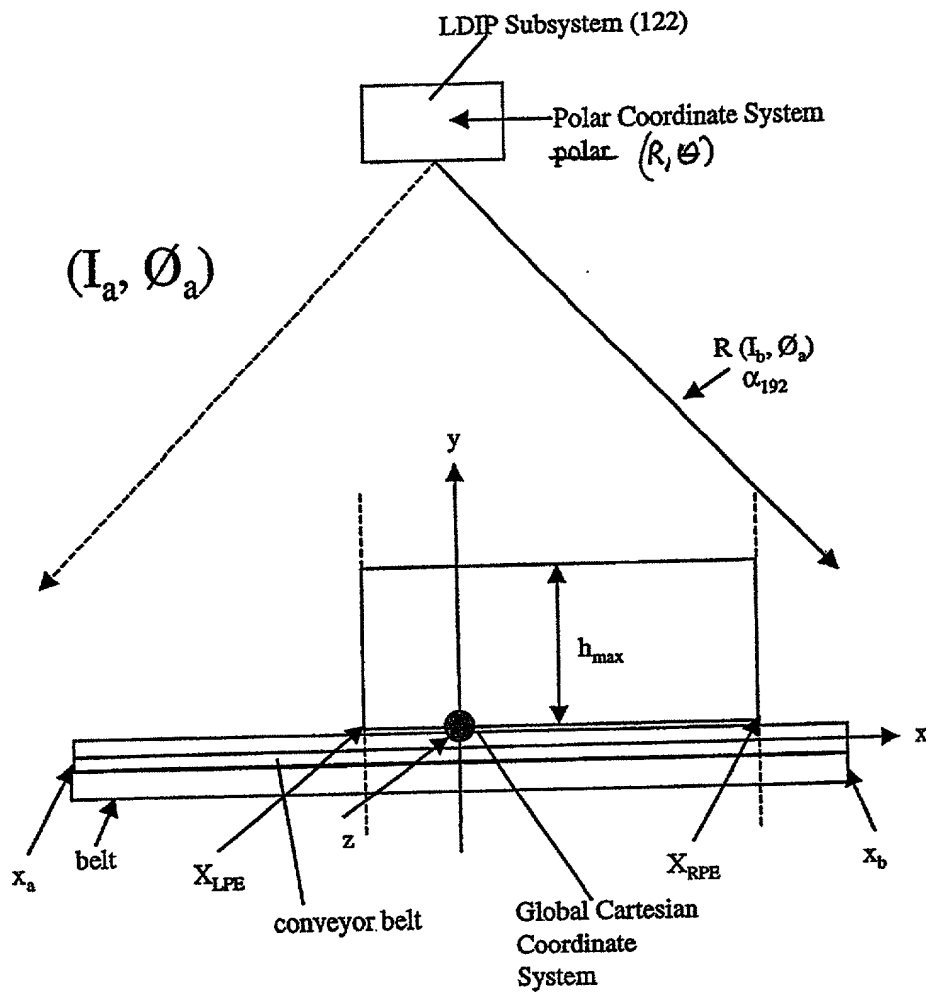


Fig. 17



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# INFORMATION MEASURED AT SCAN ANGLES BEFORE COORDINATE TRANSFORMS

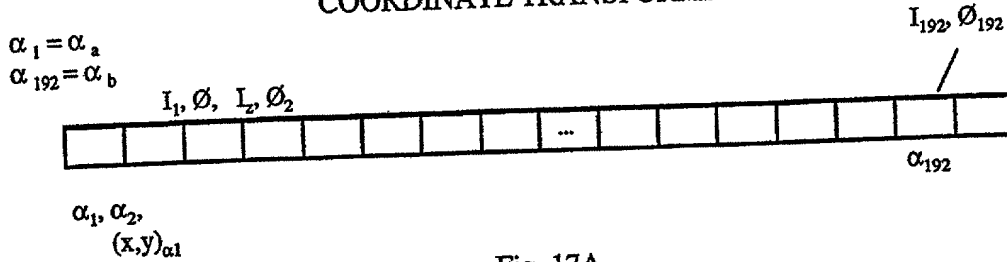


Fig. 17A

## RANGE AND POLAR ANGLE MEASURES TAKEN AT SCAN ANGLE $\alpha$ BEFORE COORDINATE TRANSFORMS

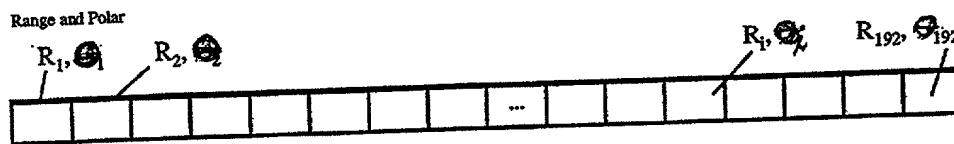


Fig. 17B

## MEASURED PACKAGE HEIGHT AND POSITION VALUES AFTER COORDINATE TRANSFORMS

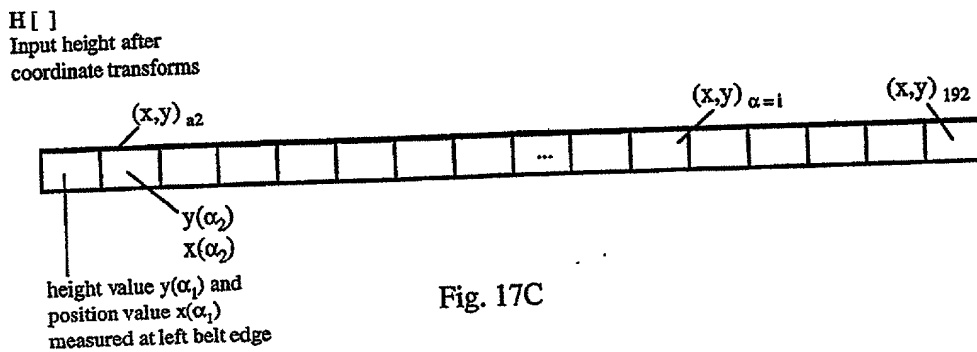


Fig. 17C

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CAMERA CONTROL PROCESS CARRIED OUT WITHIN THE CAMERA  
CONTROL SUBSYSTEM OF EACH OBJECT IDENTIFICATION AND  
ATTRIBUTE ACQUISITION SYSTEM OF PRESENT INVENTION

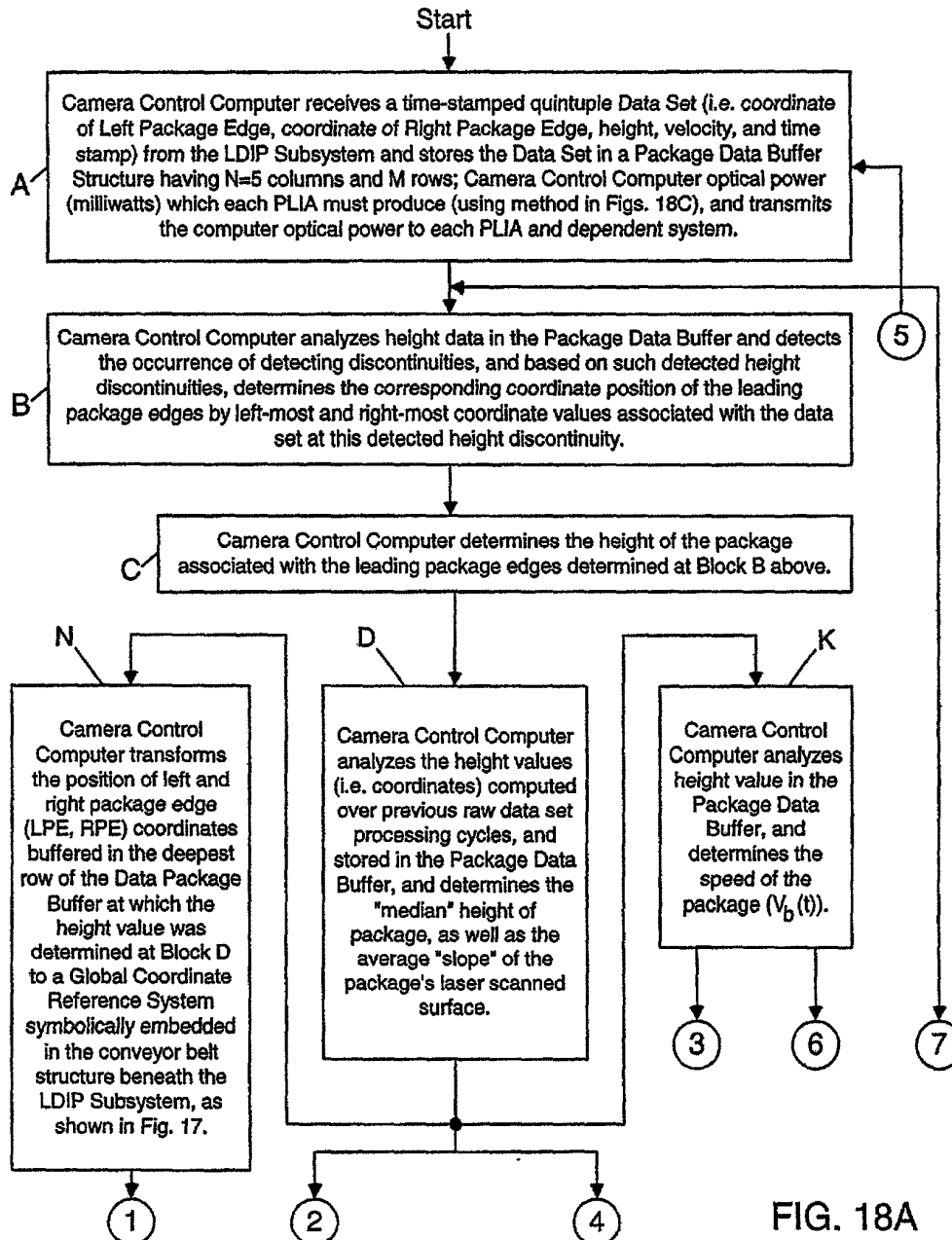
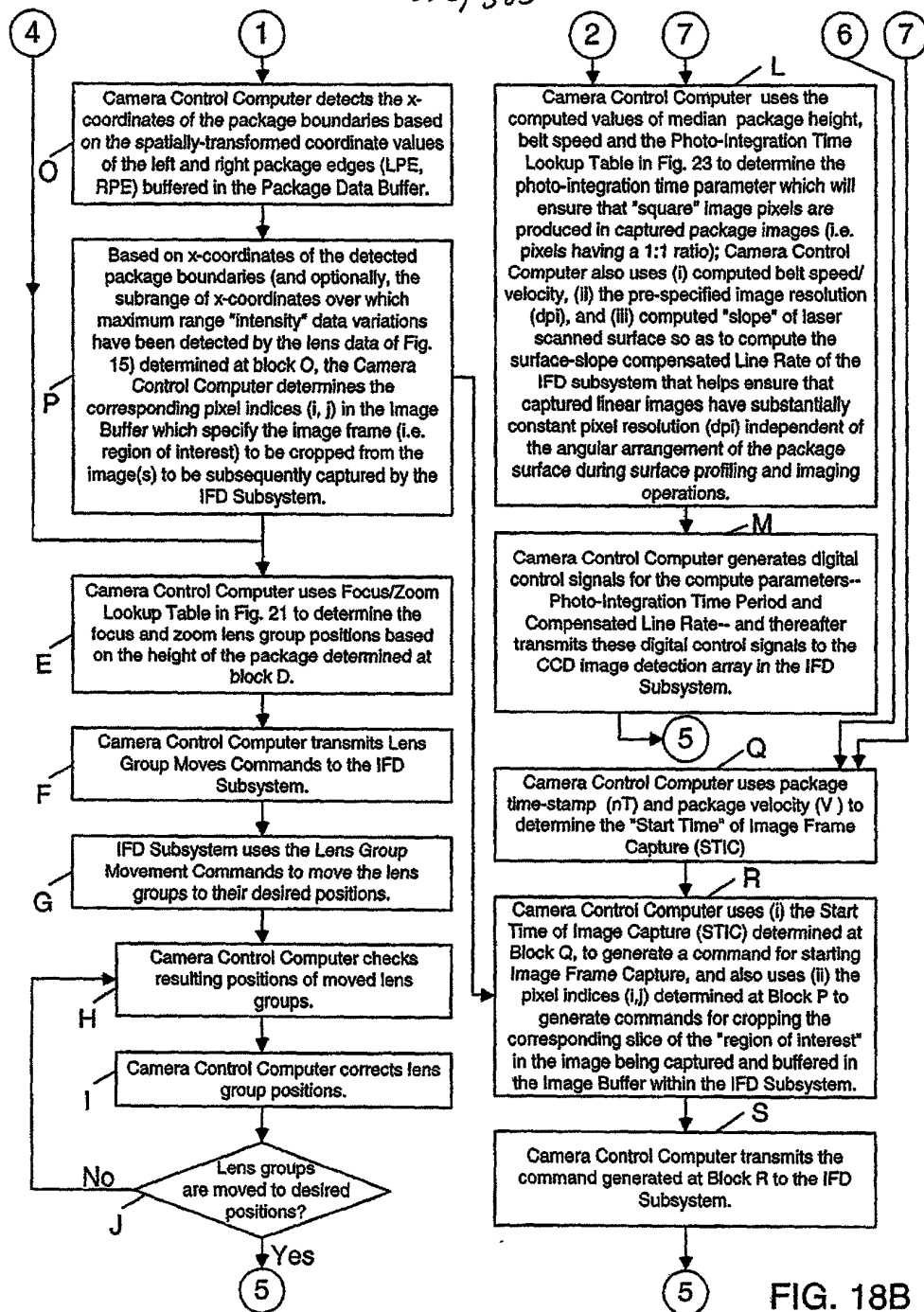


FIG. 18A

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METHOD OF COMPUTING OPTICAL OUTPUT POWER FROM CASE  
DIODES IN PLANAR LASER ILLUMINATION ARRAY (PLIA) FOR  
CONTROLLING CONSTANT WHITE LEVEL IN IMAGE PIXELS CAPTURED  
BY PLIIM-BASED LINEAR IMAGER

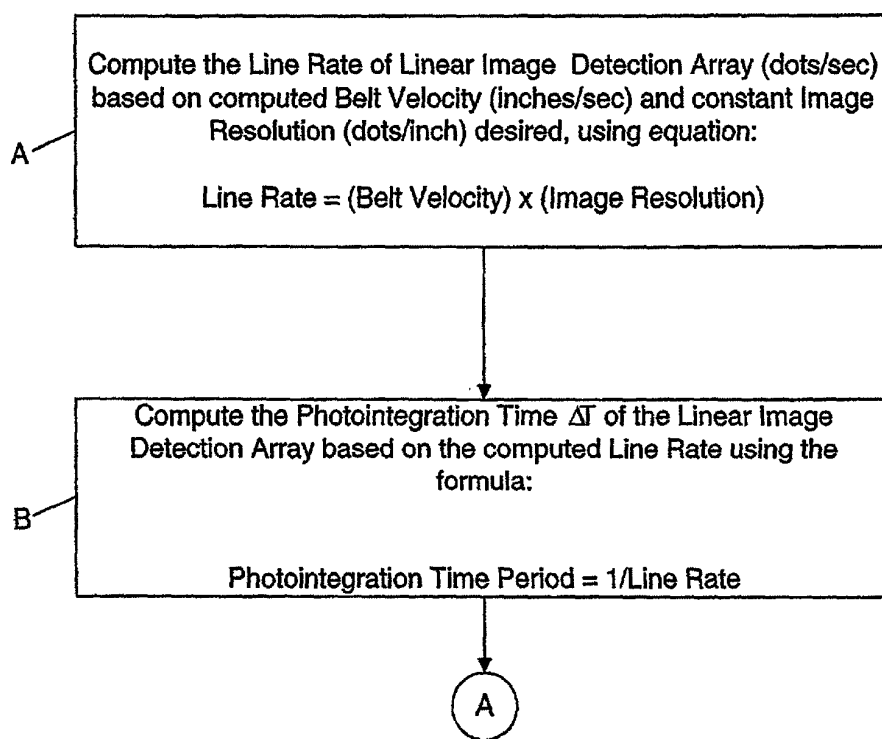


FIG. 18C1

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A



Compute the Optical Power (milliwatts) of each PLIA based on computed Photointegration Time Period ( $\Delta T$ ) using the following formula:

$$\text{Optical Power of VLD (milliwatts)} = \frac{\text{constant}}{\text{Photointegration Time Period } \Delta T}$$

FIG. 18C2

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METHOD OF COMPUTING COMPENSATED LINE RATE FOR CORRECTING  
VIEWING-ANGLE DISTORTION OCCURING IN IMAGES OF OBJECT  
SURFACES CAPTURED AS OBJECT SURFACES MOVE PAST PLIM-  
BASED LINEAR IMAGER AT NON-ZERO SKEWED ANGLE

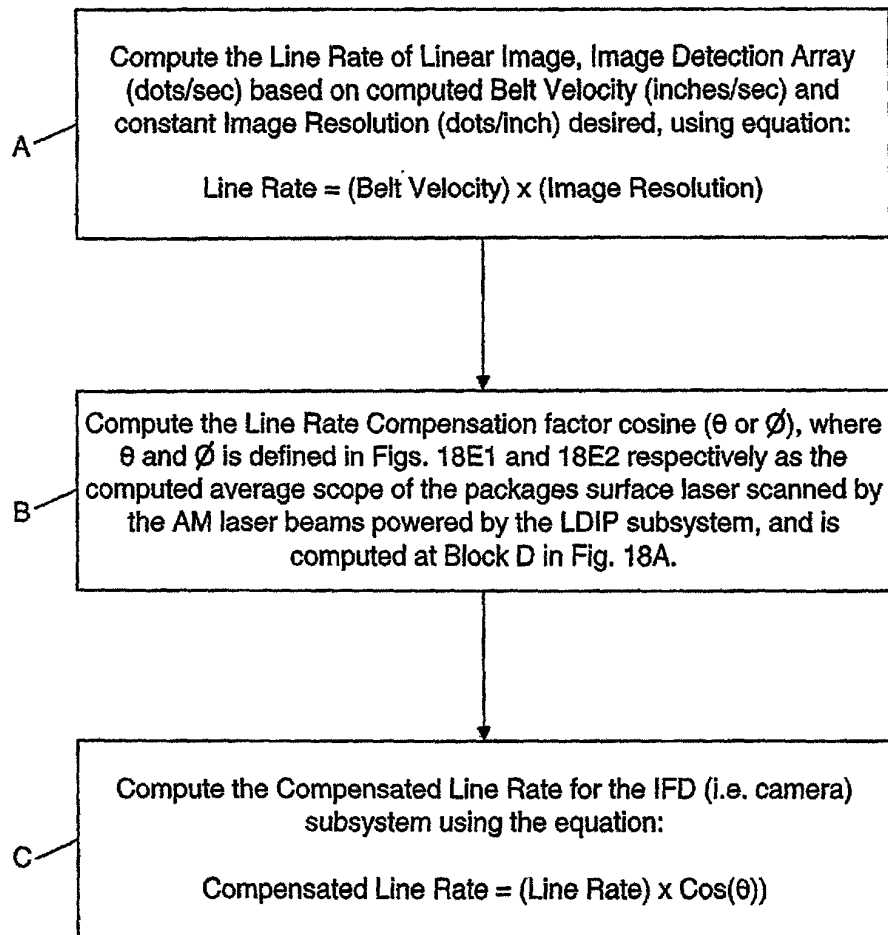


FIG. 18D

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CASE 1:  
Top Down Imaging

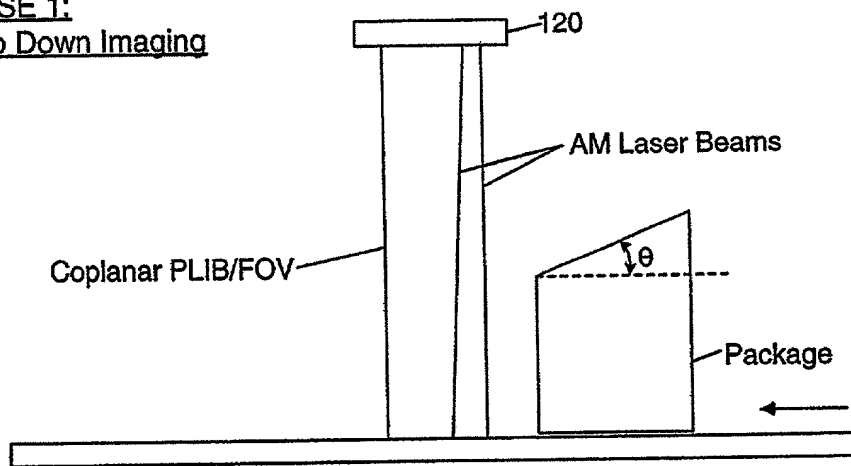


FIG. 18E1

CASE 2:  
Side Imaging

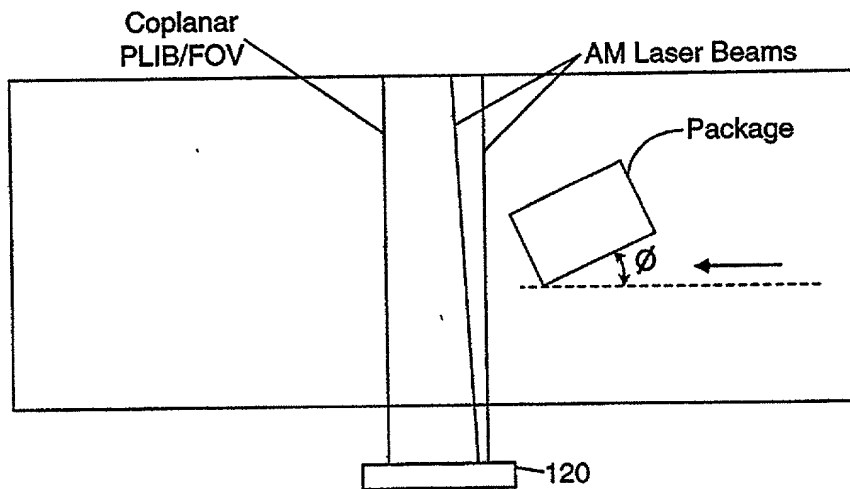


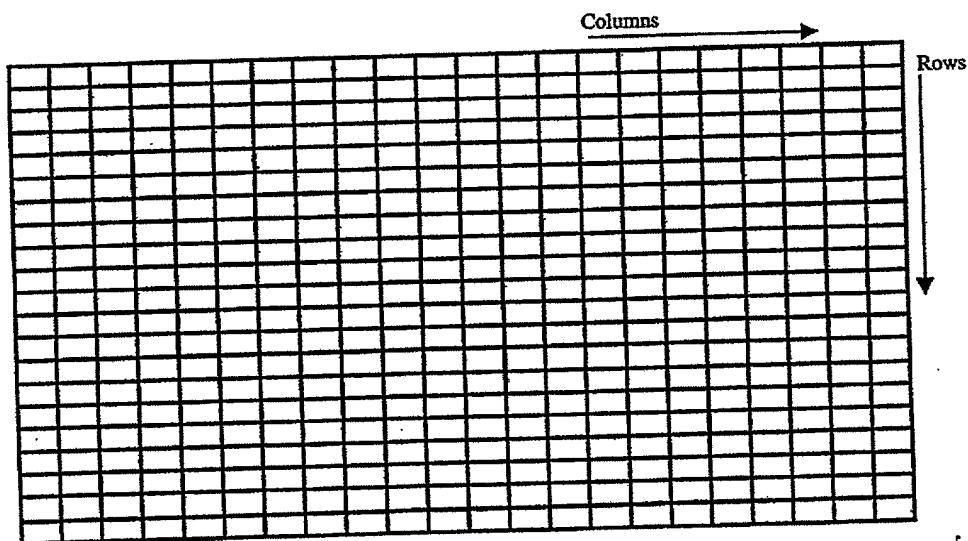
FIG. 18E2

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X coordinate subrange where  
maximum range "intensity"  
variations have been detected

Left Package Edge (LDE)	Package Height (h)	Right Package Edge (RPE)	Package Velocity	Time-stamp (nT)	
					Row 1
					Row 2
					Row 3
					Row 4
					Row 5
					Row M
Package Data Buffer (FIFO)					

Fig. 19



Camera Pixel Data Buffer  
pixel indices (i,j)

Fig. 20



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Zoom and Focus Lens Group Position  
Look-up Table

Distance from Camera H (mm)	Zoom group distance (mm) Y (Zoom)	Focus group distance (mm) Y (Focus)
1000	21.57489228	2.47E-05
1100	19.38089696	10.99009783
1200	17.10673434	20.65783177
1300	14.77137314	29.10917002
1400	12.39153565	36.47312595
1500	9.979114358	42.87845436
1600	7.540639114	48.44003358
1700	5.078794775	53.25495831
1800	2.595989366	57.40834303
1900	0.099972739	60.98883615

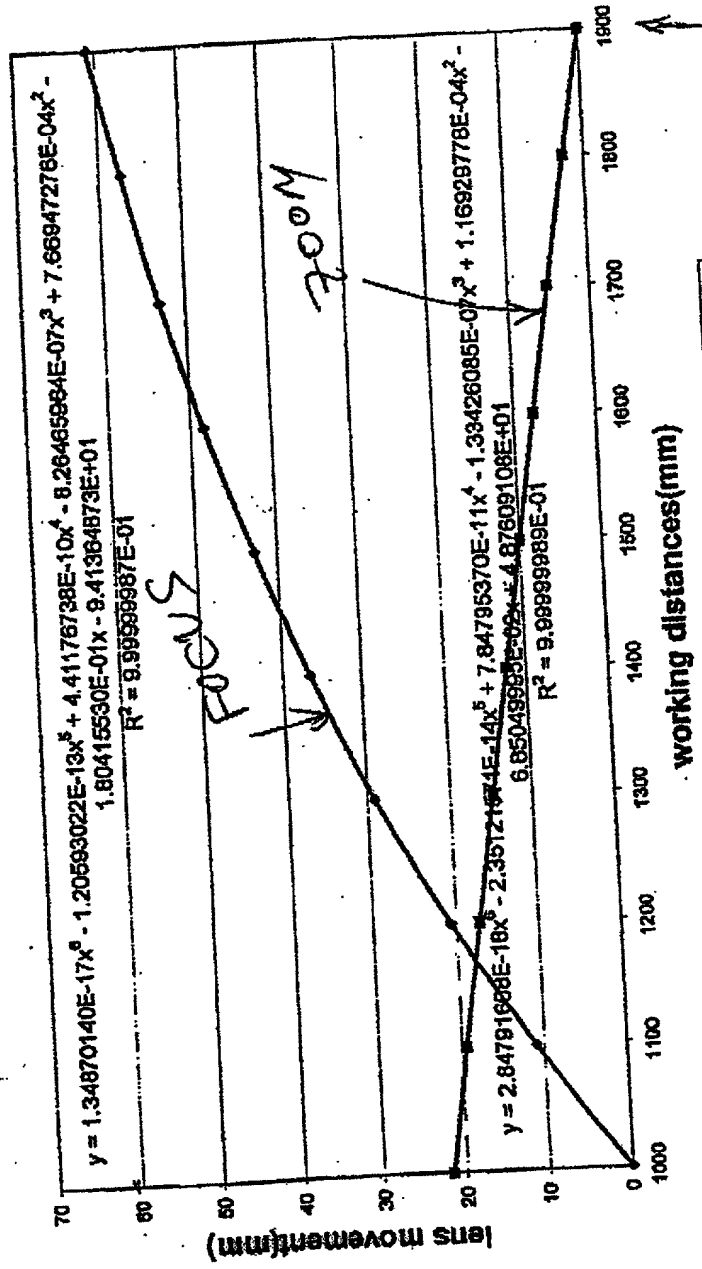
(use  
interpolation  
techniques  
for walking  
distances  
between listed  
points in  
table)

FIG. 21.

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\* Note: On feed distance & zoom (eff. focal length) in camera lens are coupled (interdependent) in camera has a fixed aperture F5.6

# Focus and Zoom lens movement vs. working distances



conveyor-belt surface

← package height above conveyor

(inches) 36 above conveyor belt

FIG. 22A

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Photo-Integration Time Look-Up Table

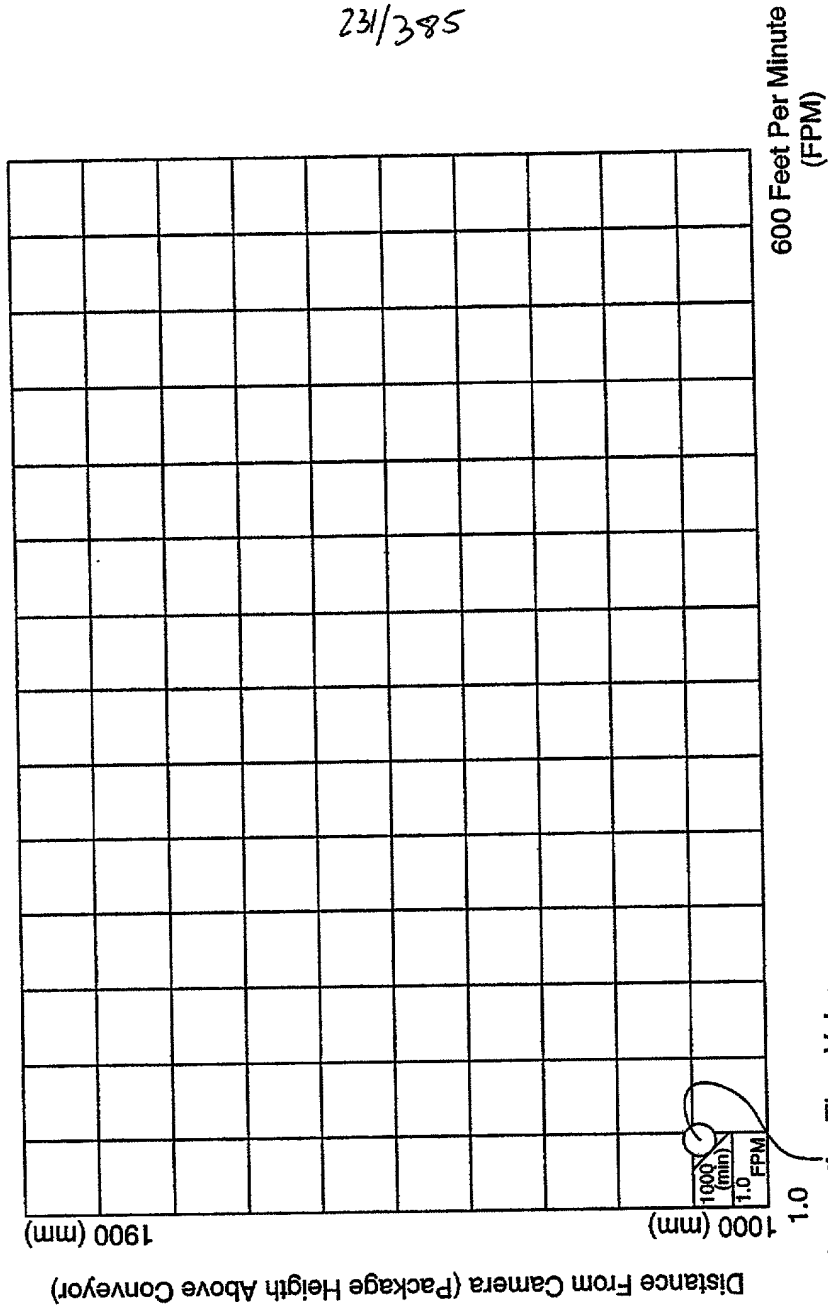


Photo-Integration Time Value  
That Ensures Square Image  
Pixels (1:1 aspect ratio)

FIG. 22B

# 3D Surface Profile And High Resolution Linear Image Data Capture At PLIIM-Based Profiling And Imaging System

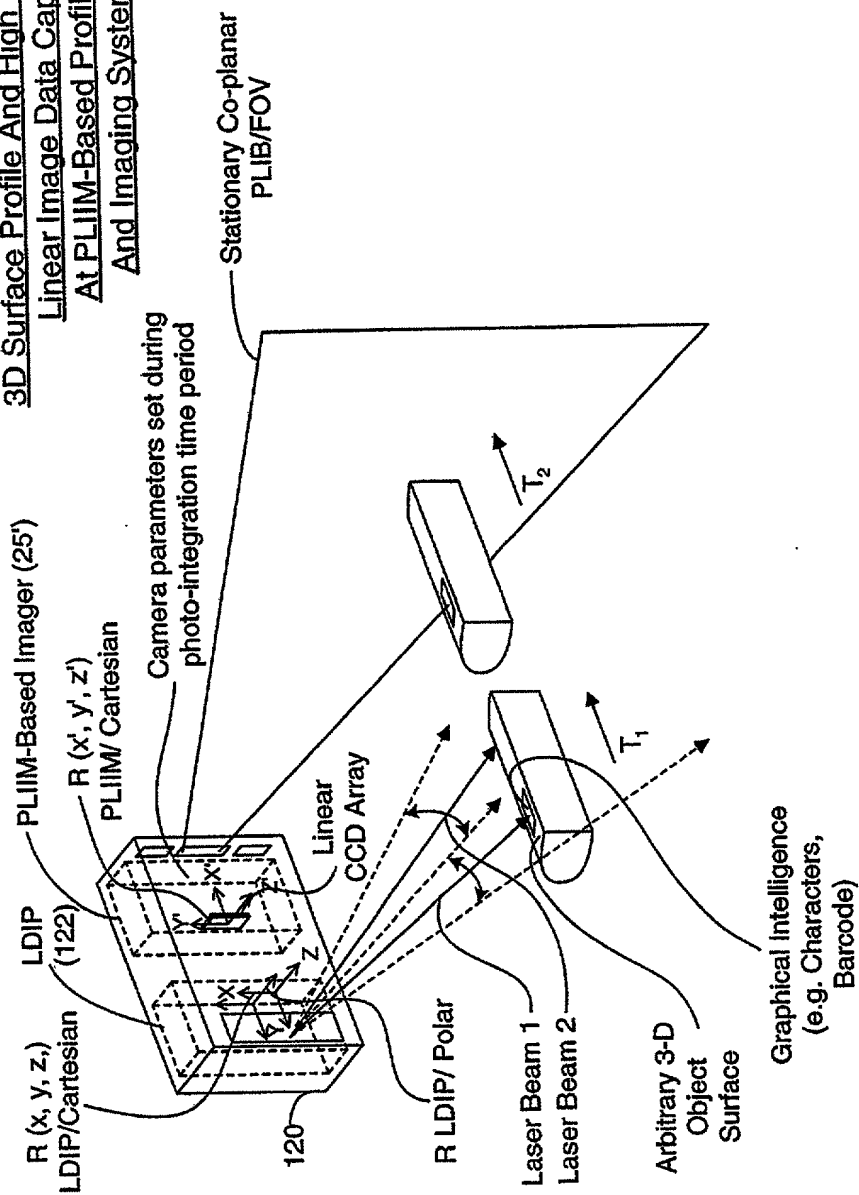


FIG. 23A

# Geometrical Modelling Of Arbitrary 3-D Object Surface At Image Processing Computer

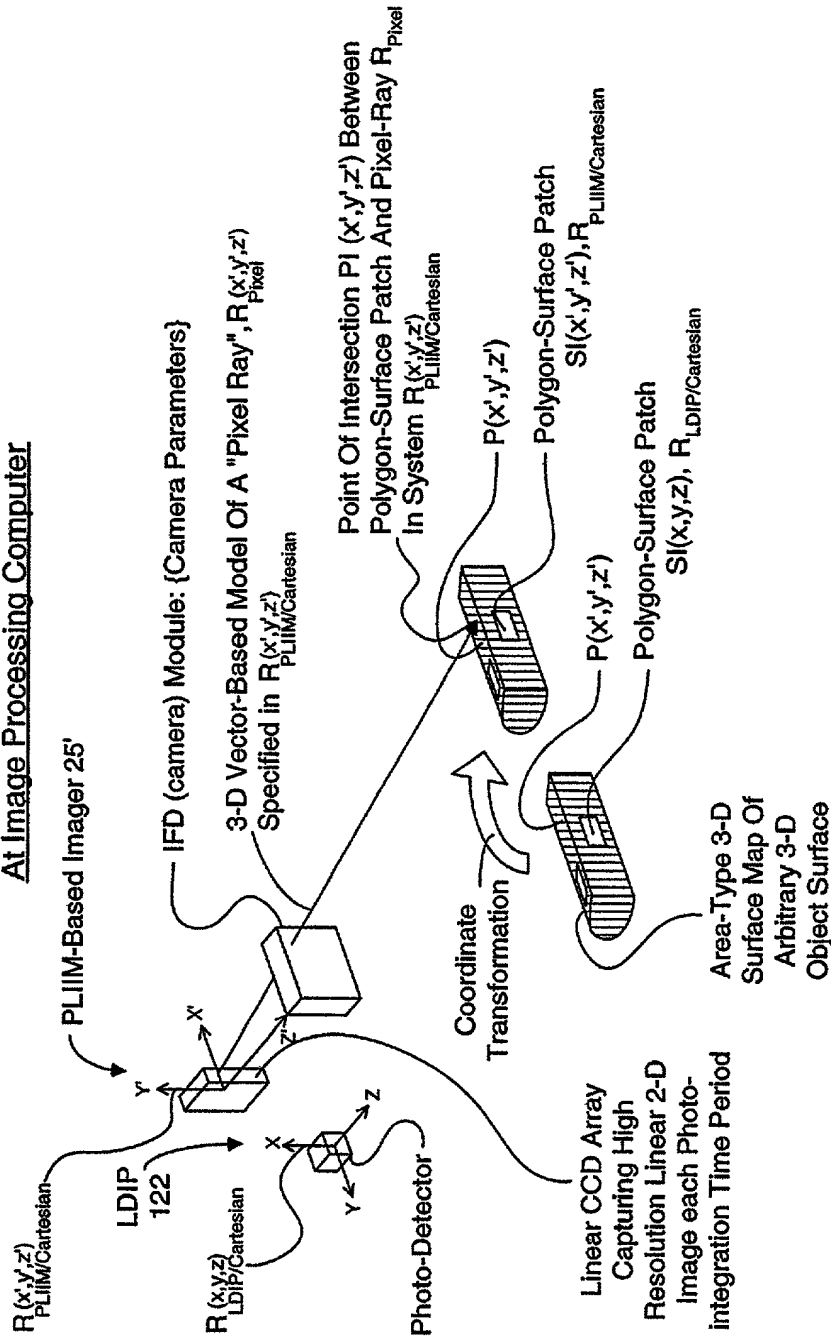


FIG. 23B

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METHOD OF AND APPARATUS FOR PERFORMING AUTOMATIC  
RECOGNITION OF GRAPHICAL INTELLIGENCE CONTAINED IN 2-D  
IMAGES CAPTURED FROM ARBITRARY 3-D OBJECT SURFACES

STEP 1: At the unitary PLIIM-based object imaging and profiling system, use the laser doppler imaging and profiling (LDIP) subsystem employed therein to (i) consecutively capture a series of linear 3-D surface profile maps on a targeted arbitrary (e.g. non-planar or planar) 3-D object surface bearing forms of graphical intelligence and (ii) measure the velocity of the arbitrary 3-D object surface, wherein the polar coordinates of each point in the captured linear 3-D surface profile map are specified in a local polar coordinate system  $R_{LDIP/polar}$ , symbolically embedded within the LDIP subsystem.

A

STEP 2: At the unitary PLIIM-based object imaging and profiling system, use coordinate transforms to automatically convert the polar coordinates of each point  $p(\alpha, R)$  in the captured linear 3-D surface profile map into  $x, y, z$  Cartesian coordinates specified as  $p(x, y, z)$  in a local Cartesian coordinate system  $R_{LDIP/Cartesian}$ , symbolically embedded within the LDIP subsystem.

B

STEP 3: At the unitary PLIIM-based object imaging and profiling system, use the PLIIM-based imager employed therein to consecutively capture high-resolution linear 2-D images of the arbitrary 3-D object surface bearing forms of graphical intelligence (e.g. symbol character strings), wherein (i) the  $x', y'$  coordinates of each pixel in each said captured high-resolution linear 2-D image is specified in local Cartesian coordinate system  $R_{PLIIM/Cartesian}$  symbolically embedded within the PLIIM-based imager, and (ii) the intensity value of the pixel  $I(x', y')$  is associated with the  $x', y'$  Cartesian coordinates of the image detection element in the linear image detection array at which the pixel is detected, and (iii) wherein also the planar laser illumination beam (PLIB) of the PLIIM-based imager is spaced from the amplitude modulated (AM) laser scanning beam of the LDIP subsystem is about D centimeters.

C

A

FIG. 23C1

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A

STEP 4: At the unitary PLIIM-based object imaging and profiling system, capture and buffer the camera (IFD) parameters used to form and detect each linear high-resolution 2-D image captured during the corresponding photo-integration time period  $\Delta T_K$ , by the PLIIM-based imager.

D

STEP 5: At the end of each photo-integration time period  $\Delta T_K$ , use the unitary PLIIM-based object imaging and profiling system to transmit the following information elements to the Image Processing Computer for data storage and subsequent information processing:

- (1) the converted coordinates  $x, y, z$ , of each point in the linear 3-D surface profile map of the arbitrary 3-D object surface captured during photo-integration time period  $\Delta T_K$ ;
- (2) the measured velocity(ies) of the arbitrary 3-D object surface during photo-integration time period  $\Delta T_K$ ;
- (3) the  $x', y'$  coordinates and intensity value  $I(x', y')$  of each pixel in each high-resolution linear 2-D image captured during photo-integration time period  $\Delta T_K$  and specified in the local Cartesian coordinate system  $R_{PLIIM/Cartesian}$ ; and
- (4) the captured camera (IFD) parameters used to form and detect each linear high-resolution 2-D image captured during the photo-integration time period  $\Delta T_K$

E

STEP 6: At the Image Processing Computer, receive the data elements transmitted from the PLIIM-based profiling and imaging system during Step 5, buffer data elements (1) and (2) in a first FIFO buffer memory structure, and data elements (3) and (4) in a second FIFO buffer memory structure.

F

B

FIG. 23C2

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(B)

STEP 7: At the Image Processing Computer, use the  $x, y, z$  coordinates associated with a consecutively captured series of linear 3-D surface profile maps (i.e. stored in first FIFO memory storage structure) in order to construct a 3-D polygon-mesh surface representation of said arbitrary 3-D object surface, represented by  $S_{LDIP}(x, y, z)$  and having (i) vertices specified by  $x, y, z$  in local coordinate reference system  $R_{PLIIM/Carthesian}$ , and (ii) planar polygon surface patches  $s_i(x, y, z)$  and being defined by a set of said vertices.

G

STEP 8: At the Image Processing Computer, convert the  $x', y', z'$  coordinates of each vertex in the 3-D polygon-mesh surface representation into the local Cartesian coordinate reference system  $R_{PLIIM/Carthesian}$  symbolically embedded within the PLIIM-based imager.

H

STEP 9: At the Image Processing Computer, specify the  $x', y', z'$  coordinates of each  $i$ -th planar polygon surface patch  $s(x, y, z)$  represented in the local Cartesian coordinate reference system  $R_{PLIIM/Carthesian}$ , so as to produce a set of corresponding polygon surface patch  $\{s_i(x', y', z')\}$  represented in system  $R_{PLIIM/Carthesian}$

I

STEP 10: At the Image Processing Computer, for a selected linear high-resolution 2-D image captured at photo-integration time period  $\Delta T_K$ , and spatially corresponding to one of the linear 3-D surface profile maps employed at Step 7, use the camera (IFD) parameters used and recorded (i.e. captured) during the corresponding photo-integration time period in order to construct a 3-D vector-based "pixel ray" model specifying the optical formation of each pixel in the linear 2-D image, wherein a pixel ray reflected off a point on the arbitrary 3-D object surface is focused through the camera's image formation optics (i.e. configured by the camera parameters) and is detected at the pixel's detection element in the linear image detection array of the IFD (camera) subsystem.

J

(C)

FIG. 23C3



200006230000

237/385  
C

STEP 11: At the Image Processing Computer, for each laser beam ray (producing one of the pixels in said selected linear 2-D image), (i) determine which polygon surface patch  $s_i(x, y, z)$  the pixel ray intersects, (ii) compute the  $x, y, z$  coordinates of the point of intersection (POI) between the pixel ray and the polygon surface patch represented in Cartesian coordinate reference system  $R_{PLIIM/Cartesian}$ , and (iii) designate the computed set of points of intersection as  $\{p_i(x, y, z)\}$ .

K

STEP 12: At the Image Processing Computer, for each laser beam ray passing through a determined polygon surface patch  $s(x', y', z')$  at a computed point of intersection  $p_i(x, y, z)$ , assign the intensity value  $I(x', y')$  of the pixel ray to the  $x', y', z'$  coordinates of the point of intersection, thereby producing a linear high-resolution 3-D image comprising a 2-D array of pixels, each said pixel having as its attributes (i) an Intensity value  $I(x', y', z')$  and (ii) coordinates  $x', y', z'$  specified in the local Cartesian coordinate reference system  $R_{PLIIM/Cartesian}$ .

L

STEP 13: Put the computed linear high-resolution 3-D image in a third FIFO memory storage structure in the image processing computer.

M

STEP 14: Repeat Steps 1-6 to update the first and second FIFO data queues maintained in the image processing computer, and Steps 7-13 to update the consecutively computed linear high-resolution 3-D image stored in the third FIFO memory storage structure.

N

STEP 15: Assemble in an image buffer in the image processing computer, a set of consecutively computed linear high-resolution 3-D images retrieved from the third FIFO data storage device so as to construct an "area-type" high-resolution 3-D image of said arbitrary 3-D object surface.

O

D

FIG. 23C4

(D)

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STEP 16: At the Image Processing Computer, map the intensity value  $I(x', y', z')$  of each pixel in the computed area-type 3-D image onto the  $x', y', z'$  coordinates of the points on a uniformly-spaced apart "grid" positioned perpendicular to the optical axis of the camera subsystem (i.e. to model the 2-D planar substrate on which the forms of graphical intelligence was originally rendered), wherein said mapping process involves using an intensity weighing function based on the  $x', y', z'$  coordinate values of each pixel in the area-type high-resolution 3-D image, thereby producing an area-type high-resolution 2-D image of the 2-D planar substrate surface bearing said forms of graphical intelligence (e.g. symbol character strings).

P

STEP 17: At the Image Processing Computer, use said OCR algorithm to perform automated recognition of graphical intelligence contained in said area-type high-resolution 2-D image of said 2-D planar substrate surface so as to recognize said graphical intelligence and generate symbolic knowledge structures representative thereof.

Q

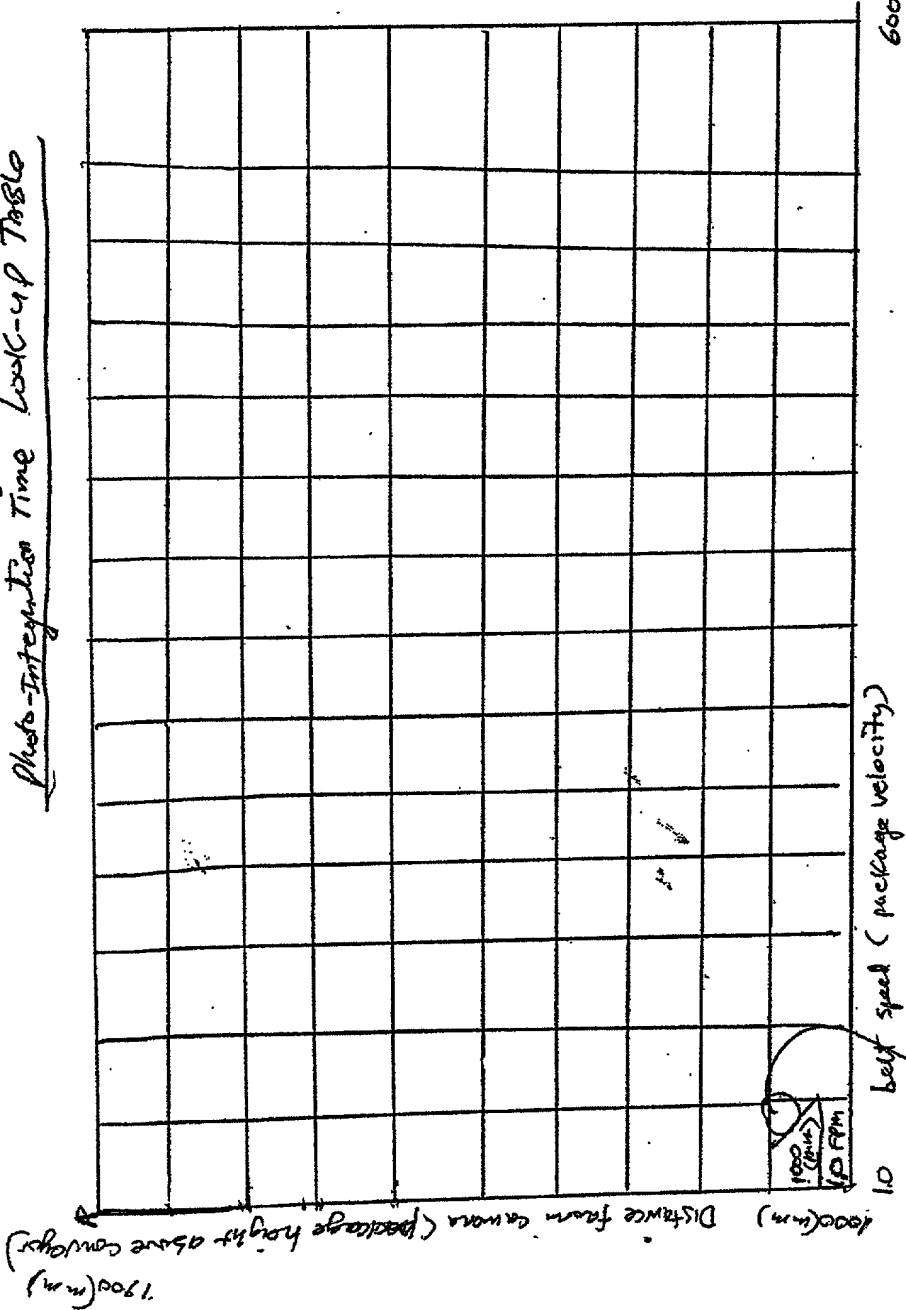
STEP 18: Repeat Steps 1-17 as often as required to recognize changes in graphical intelligence on the arbitrary moving 3-D object surface.

R

FIG. 23C5

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Photo-Integration Time Look-up Table



600 feet per minute  
(FPM)

FIG. 22B

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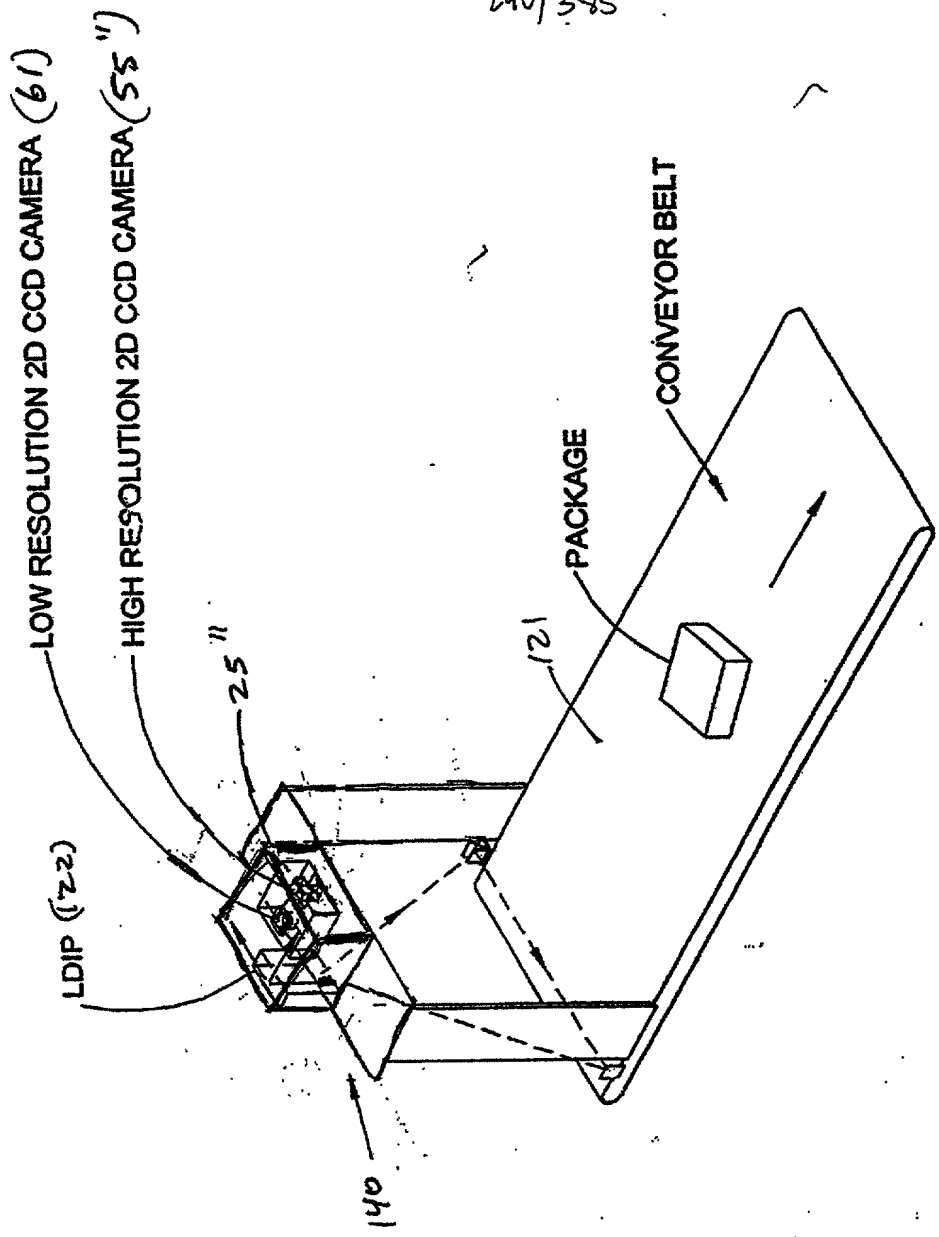


FIG 24

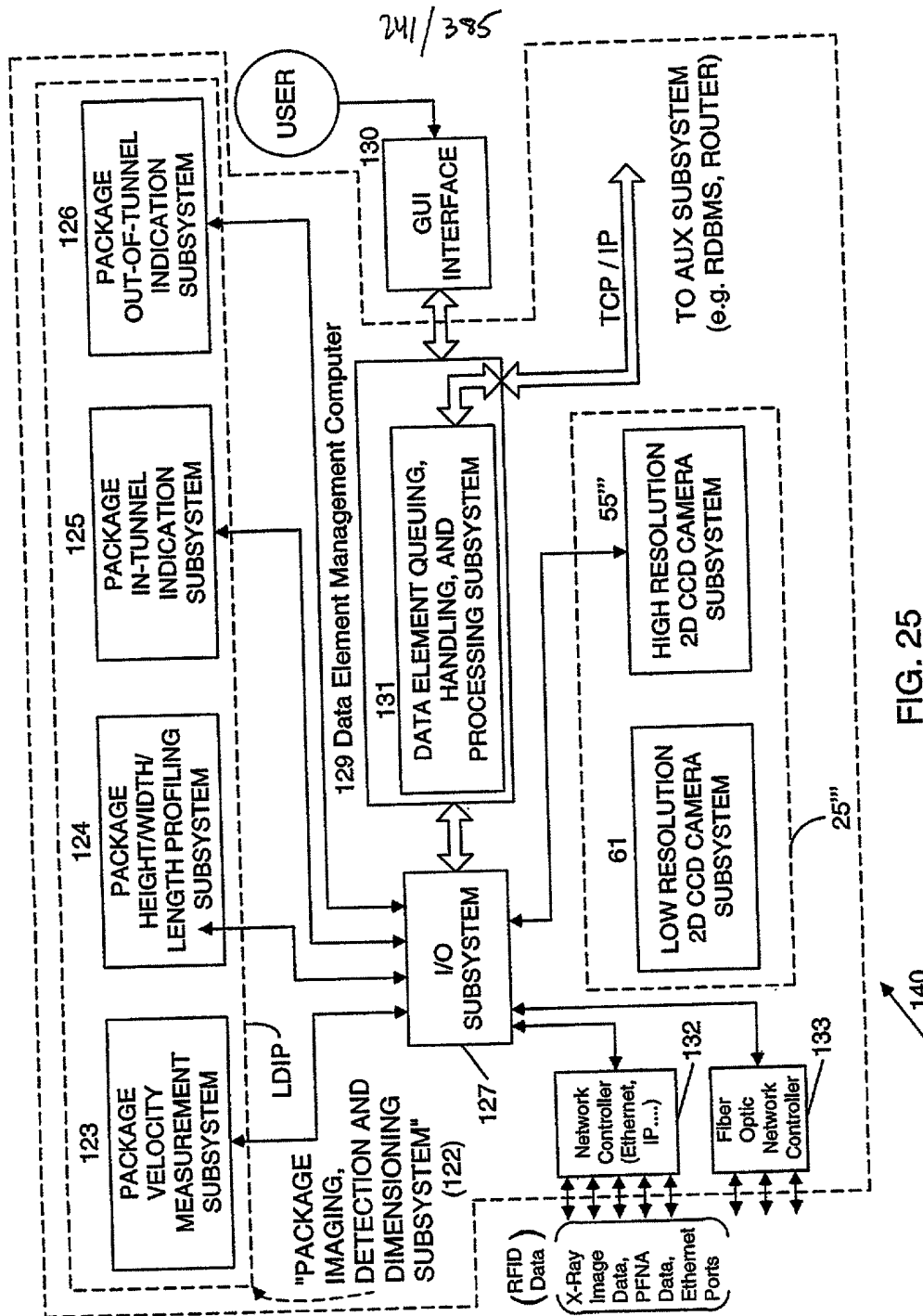


FIG. 25

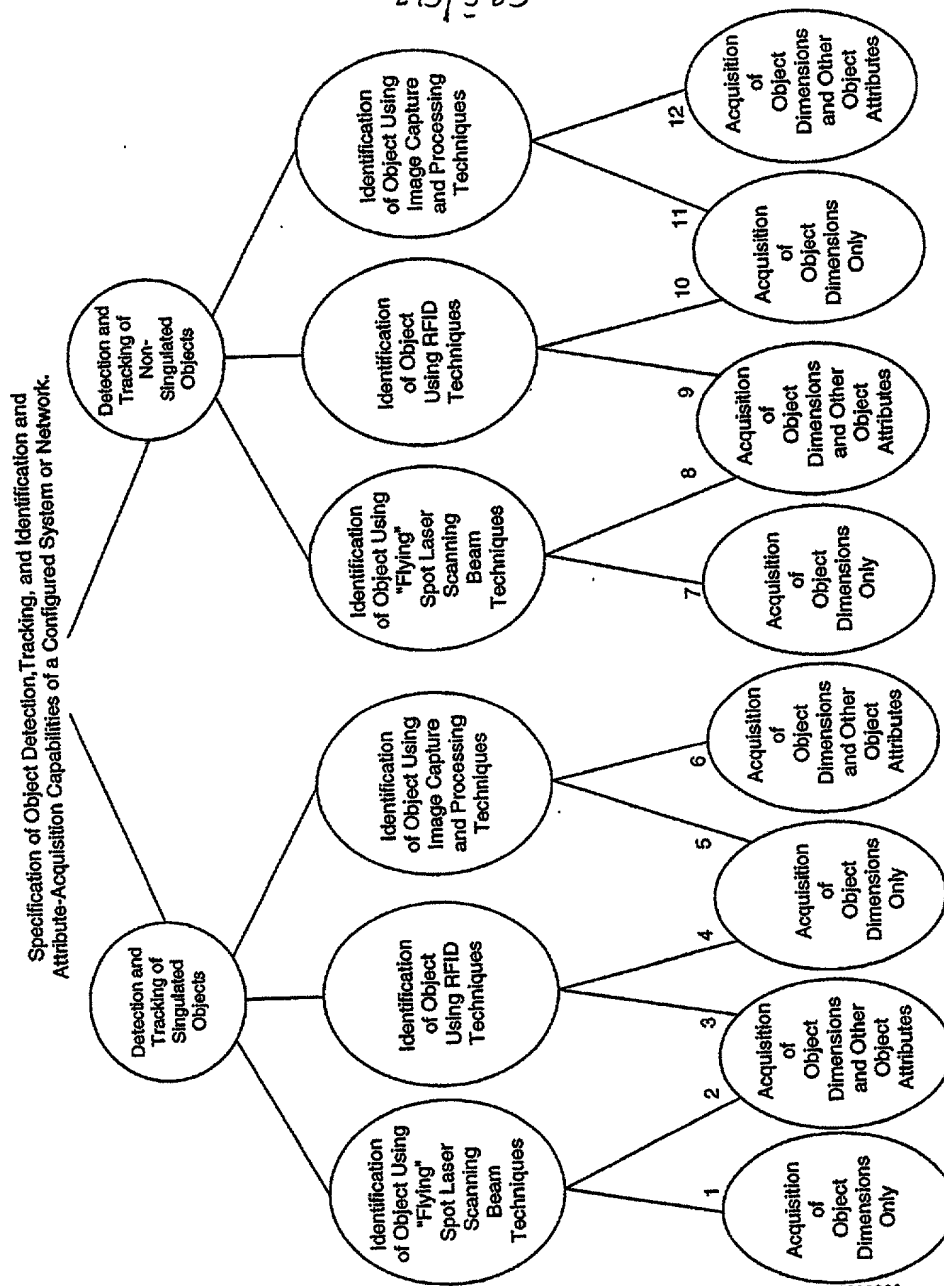


**Primary Network:  
and/ or System  
Functions:**

A. Specification of Object  
Detection and  
Tracking Capability of  
System

B. Specification of Object  
Identification  
Capability of System

C. Specification of  
Object Attribute  
Acquisition Capability  
of System



**FIG. 25B**

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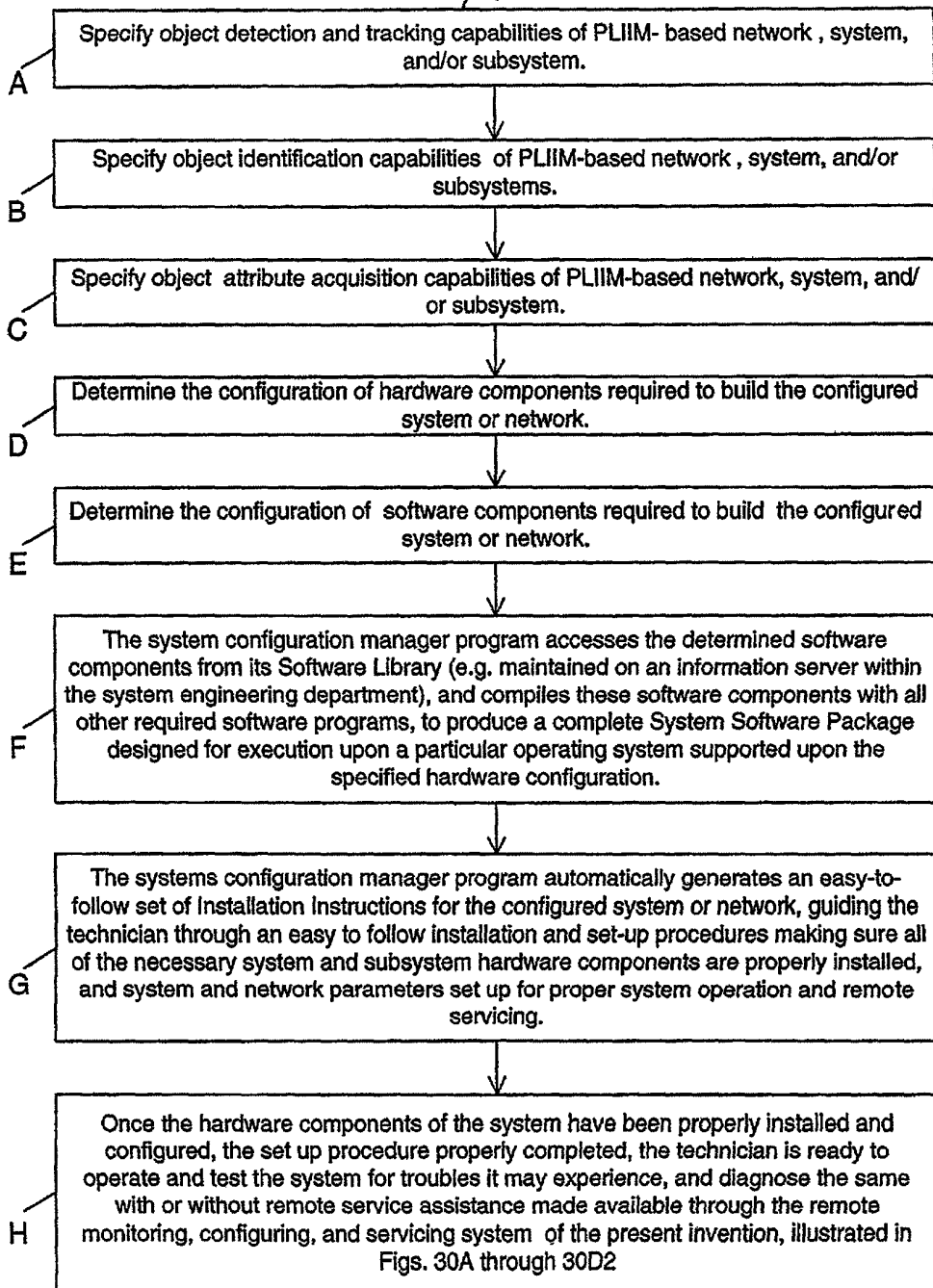


FIG. 25C



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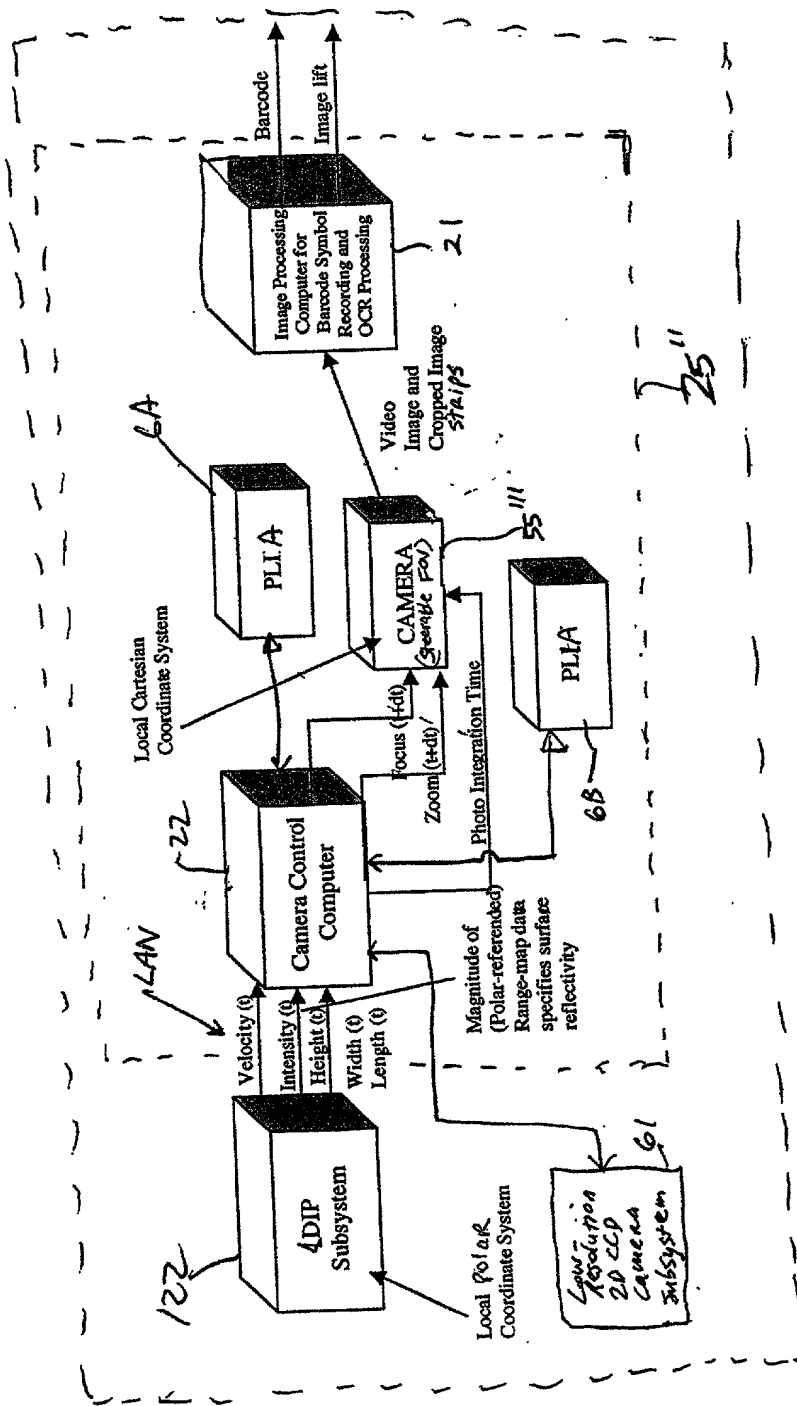
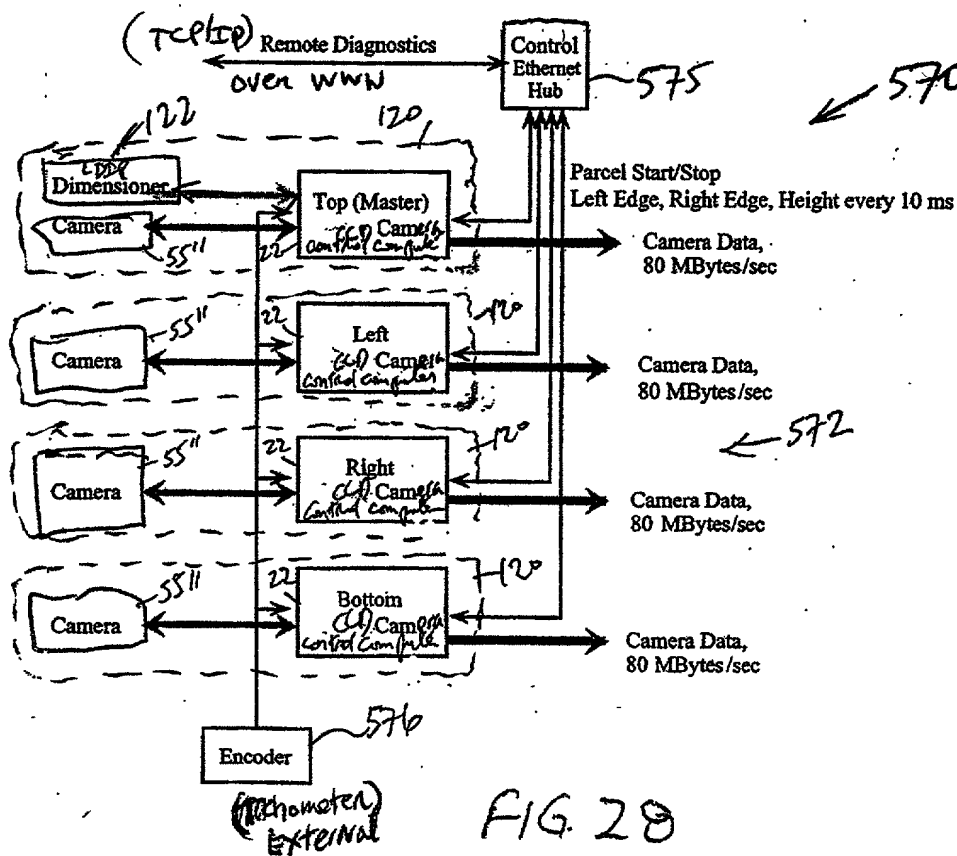
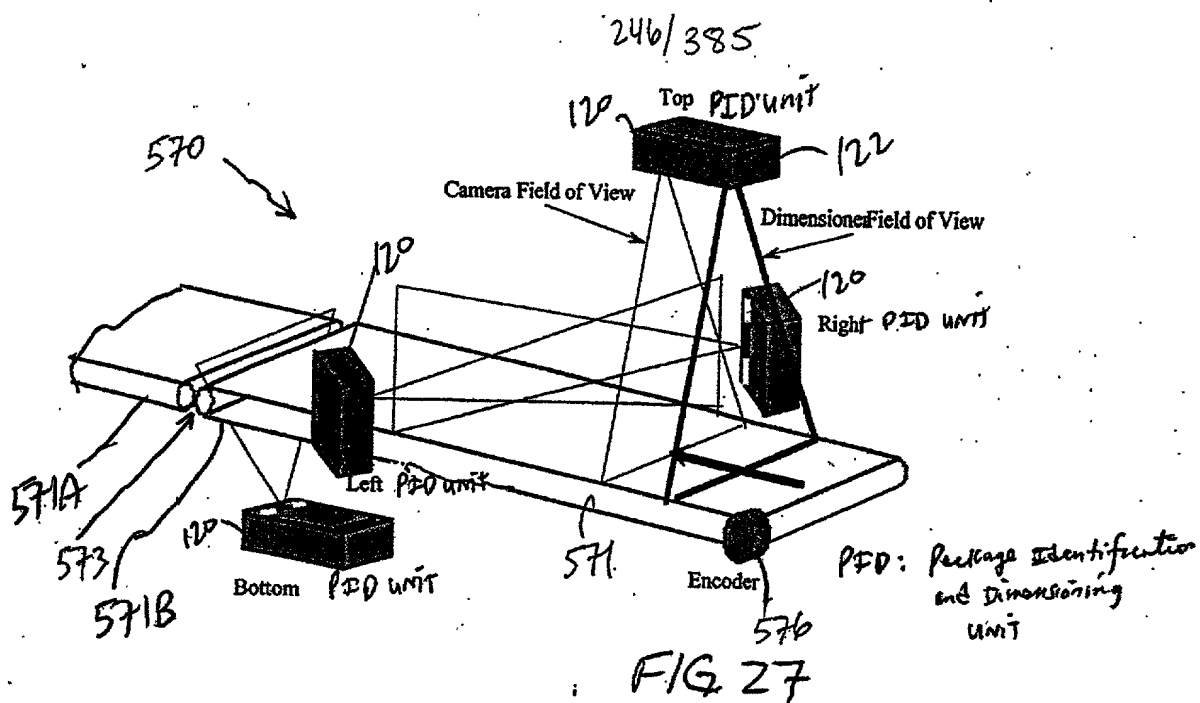


FIG. 26



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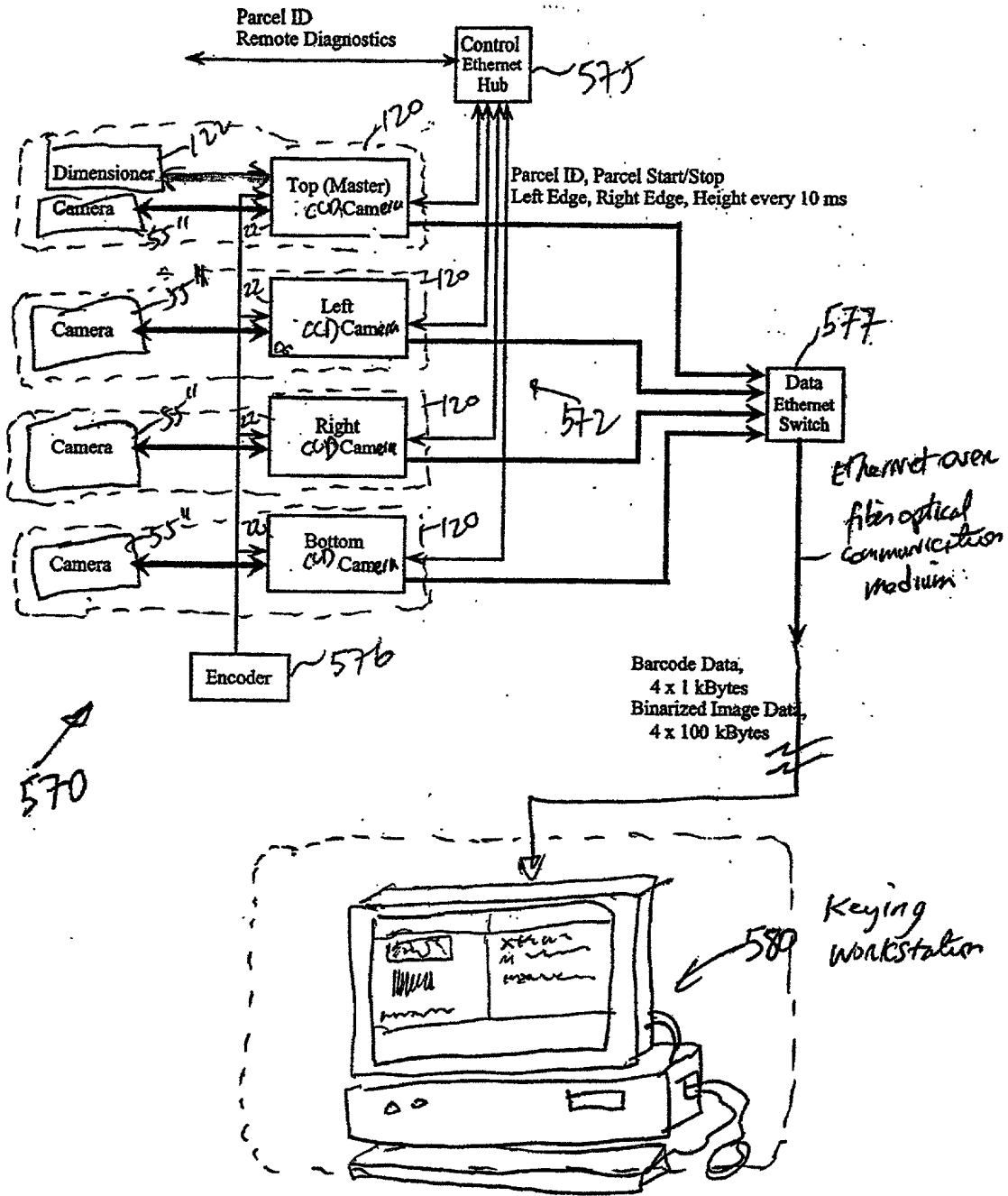


FIG. 29

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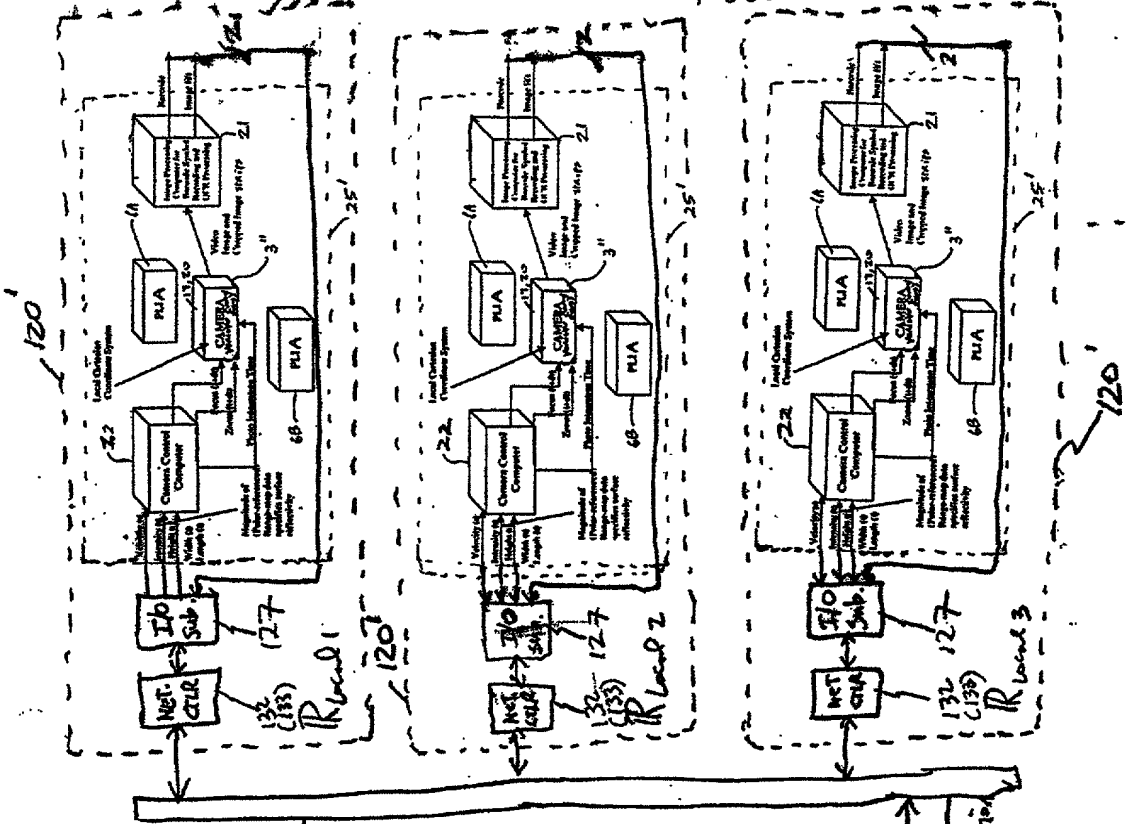
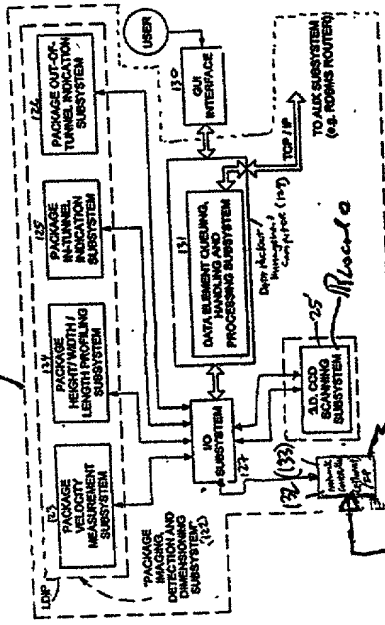


FIG 30

570

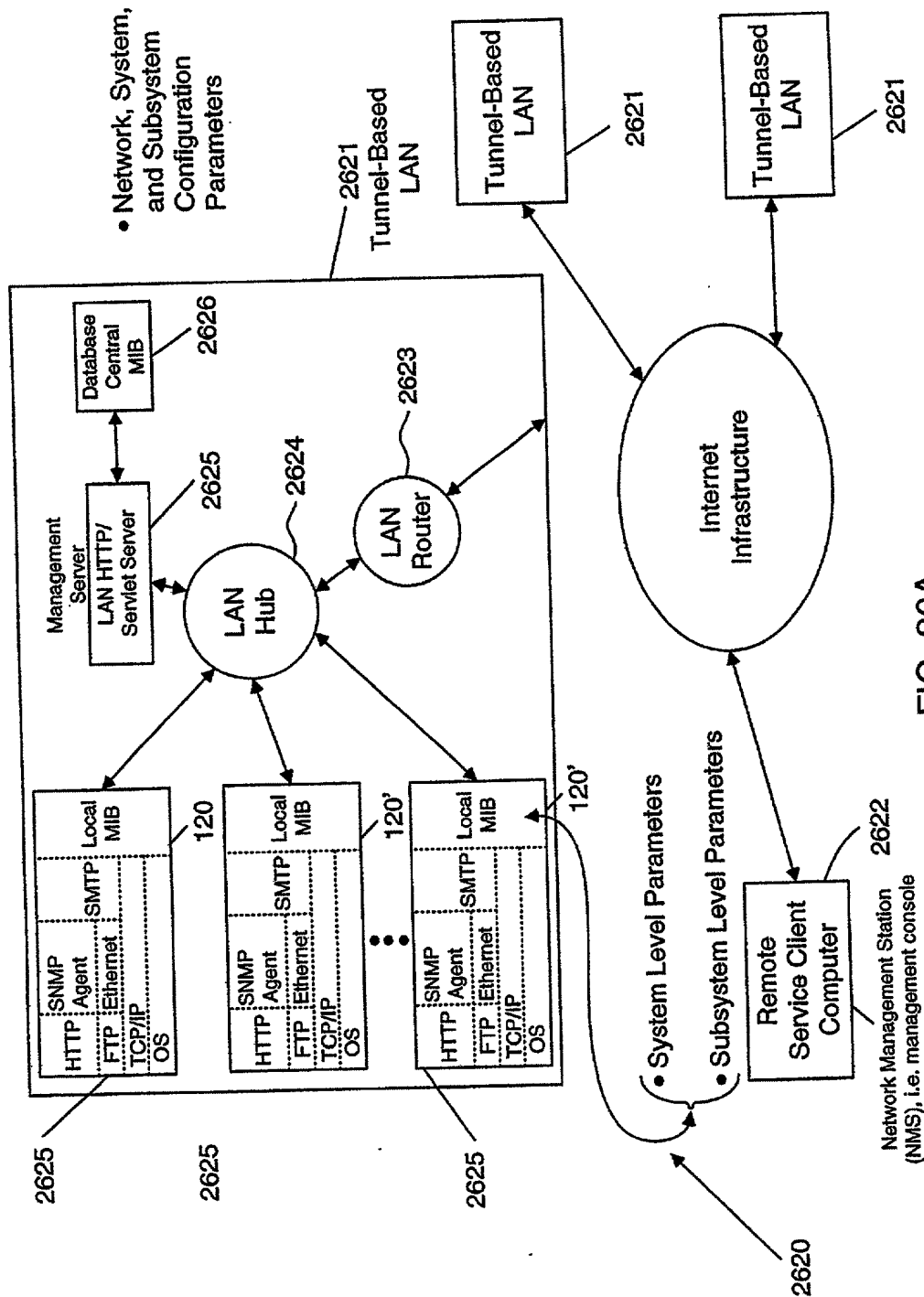
120



Coordinate Data  
References  
with  
respect to  
Global  
Reference  
(Velocity(t)  
Intensity(t)  
Height(t)  
Width(t)  
Length(t))

Network  
Communication  
Medium

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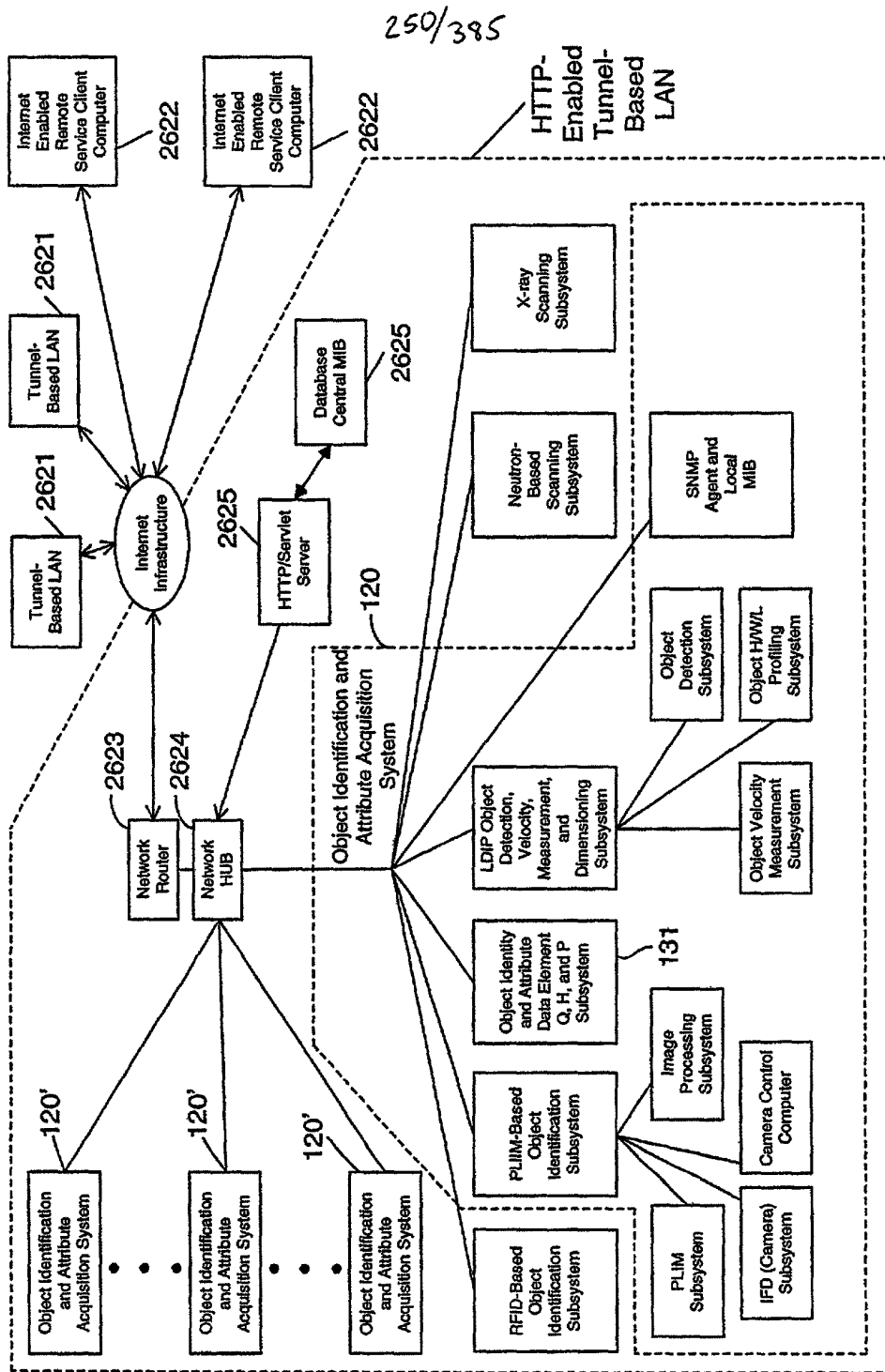


FIG. 30B

### Network Configuration Parameters:

[ Router IP address; no. of nodes (i.e. systems) in LAN; passwords, LAN location; name of customer facility; technical contact; phone no.; domain name; object identity codes; object attribute acquisition codes;....]

### System Configuration Parameters:

[ System IP Address; passwords; object identity codes; object attribute acquisition codes;....]

### Monitorable and/or Configurable Parameters for Subsystems Within Each System:

- |  |  |
|--|--|
| <p>These subsystems generate object identity parameters</p>  | <p><input type="checkbox"/> PLIM-based object identification subsystem: [ object identity code; object attribute acquisition codes;....]</p> <p><input type="checkbox"/> PLIM Subsystem: [VLD status; power VLD; TIM function; temp;....]</p> <p><input type="checkbox"/> IFD ( Camera) Subsystem: [sensor temp; ....]</p> <p><input type="checkbox"/> Image Processing Subsystem (Computer): [processor load history; system up time; # of frames (pgs); barcode read rate; current line rate;....]</p> <p><input type="checkbox"/> Camera Contact Subsystem (Computer): [number of frames dropped; number of focused zoom commands; number and kinds of motor control errors;....]</p> |
| <p>This system links object attribute data element parameters (i.e. object identity data element) to corresponding object identity parameters (i.e. object attribute data element)</p> | <p><input type="checkbox"/> RFID-based object identification subsystem: [....]</p> <p><input type="checkbox"/> Object identity and attribute data element queuing, handling and processing subsystem: [....]</p>   |
| <p>These subsystems generate object attribute parameters</p>   | <p><input type="checkbox"/> LDIP object identification, velocity-measurement, and dimensioning subsystem: [....]</p> <p><input type="checkbox"/> Object velocity measurement subsystem: [polygon RPM; polygon laser output X; channel X drift; channel X noise; trigger error events; instant lock reference drift; temperature]</p> <p><input type="checkbox"/> Object H/W/L profiling subsystem</p> <p><input type="checkbox"/> Object detection subsystem: [non-singulation/ singulation code;....]</p> <p><input type="checkbox"/> X-ray scanning subsystem: [....]</p> <p><input type="checkbox"/> Neutron-beam scanning subsystem: [....]</p>                                      |

FIG. 30C

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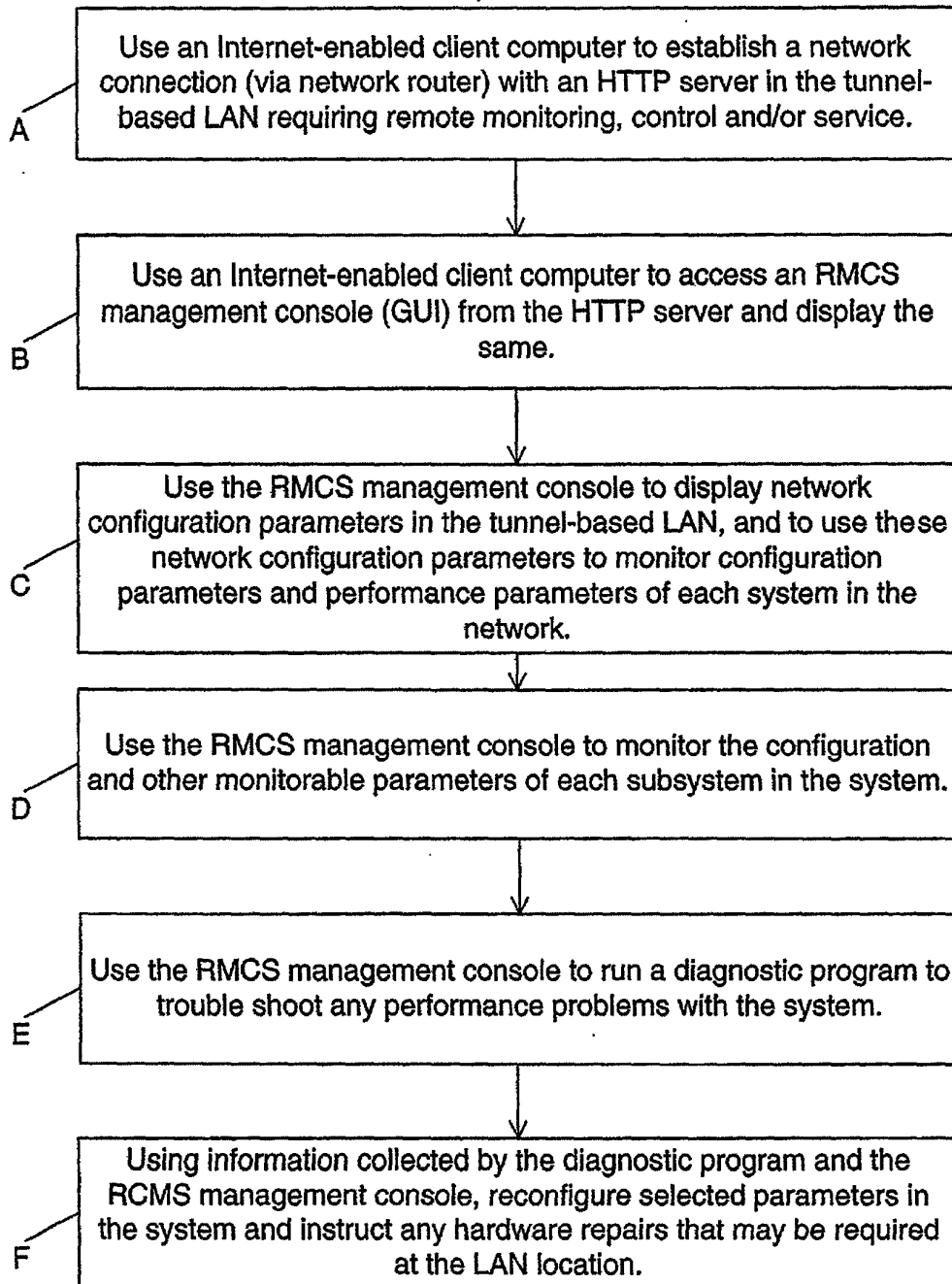


FIG. 30D1



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G

Use the RMCS management console to rerun diagnostic programs on troubled systems and subsystems in the LAN after parameter reconfiguration and/or hardware repair at the LAN location, so as to test the performance of such systems and subsystems and the overall tunnel based LAN.

H

Use the RMCS management console to monitor parameters of the system and subsystems in the tunnel based LAN, from time to time, to determine whether or not the system and/or network tunnel is required.

I

Use the RMCS management console to record all monitored parameter records and result of diagnostic programs in a customer service database for future reference, and access during subsequent remote service calls over the Internet.

FIG. 30D2

CCD Camera-Based Tunnel System  
Employing Package Coordinate Data  
Driven Method of Automatic Camera  
Zoom and Focus Control

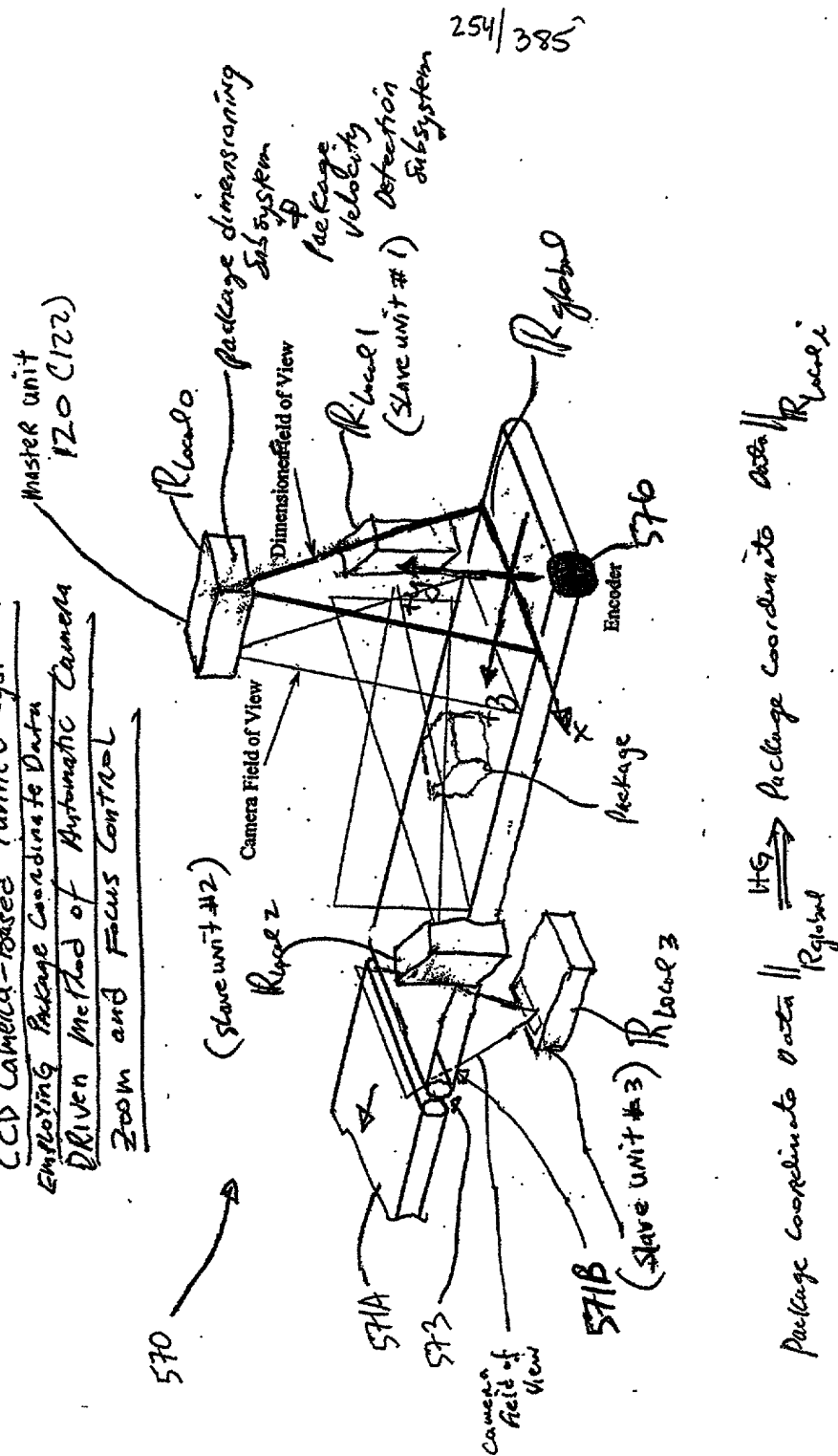


FIG. 31

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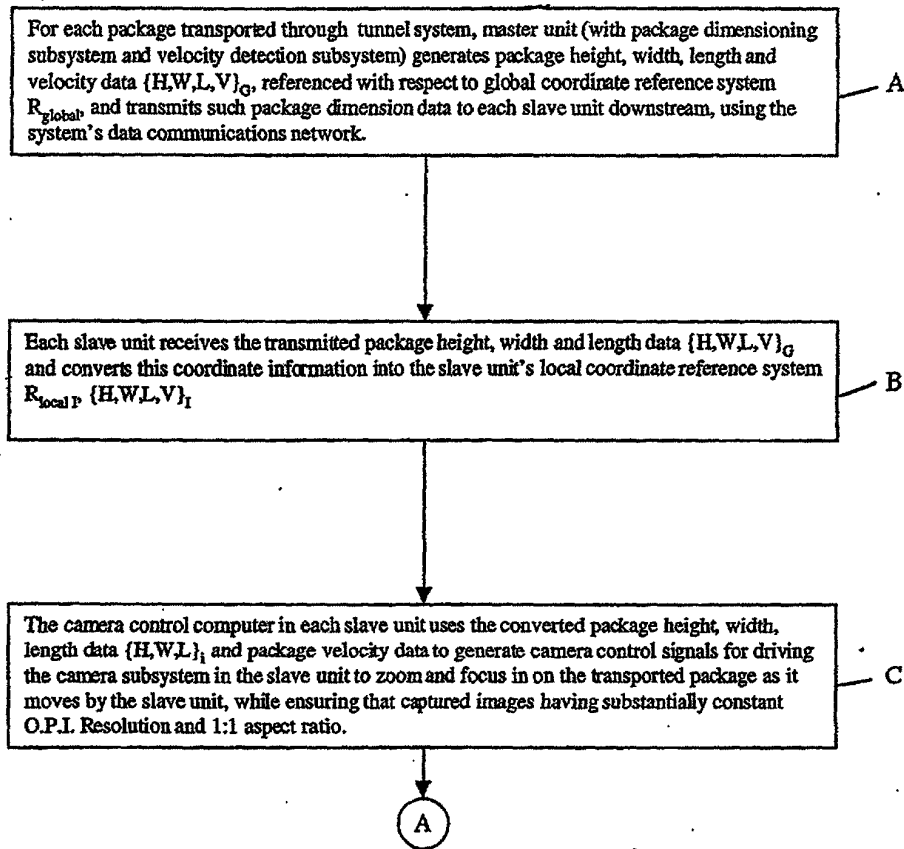


FIG. 32A

2000000 552 6444

256/385  
A

Each slave unit captures images acquired by its intelligently controlled camera subsystem, buffers the same, and processes the images to decode bar code symbol identifiers represented in said images, and/or to perform optical character recognition (OCR) thereupon.

D

The slave unit which decodes a bar code symbol in a processed image automatically transmits a package identification data element (containing symbol character data representative of the decoded bar code symbol) to the master unit (or other designated system control unit employing data element management functionalities) for package data element processing.

E

Master unit time-stamps received package identification data element, places said data element in a data queue, and processes package identification data elements and time-stamped package dimension data elements in said queue to link each package identification data element with one said corresponding package dimension data element.

F

FIG. 32B

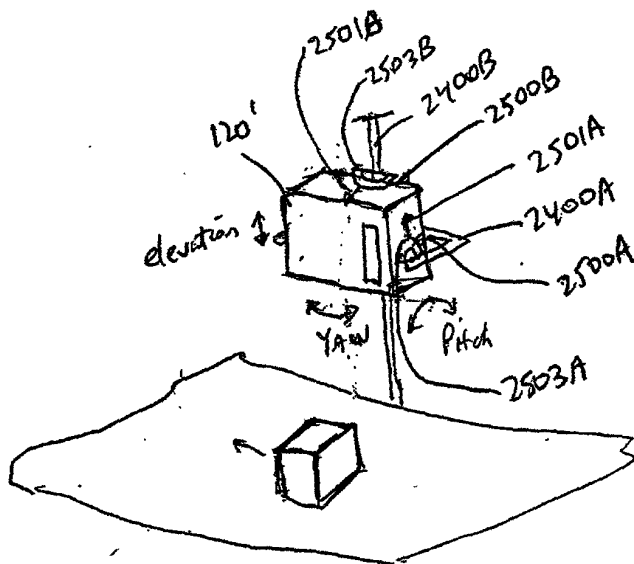
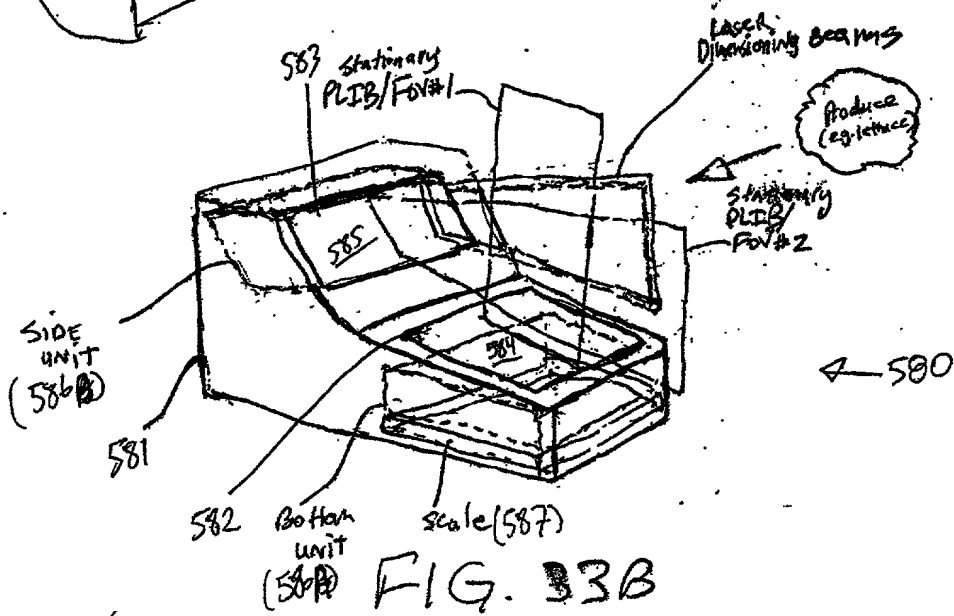
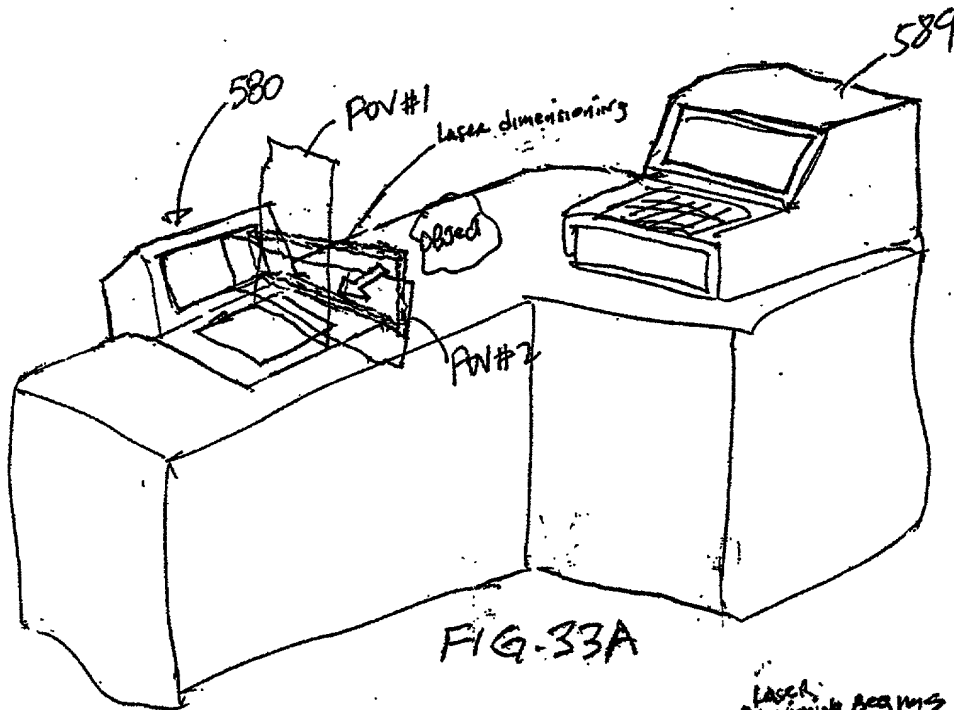


FIG. 31A

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580

587

589

Host Computer  
(e.g. 585 Register)

588

582

581

583

584

585

586

587

588

589

590

591

592

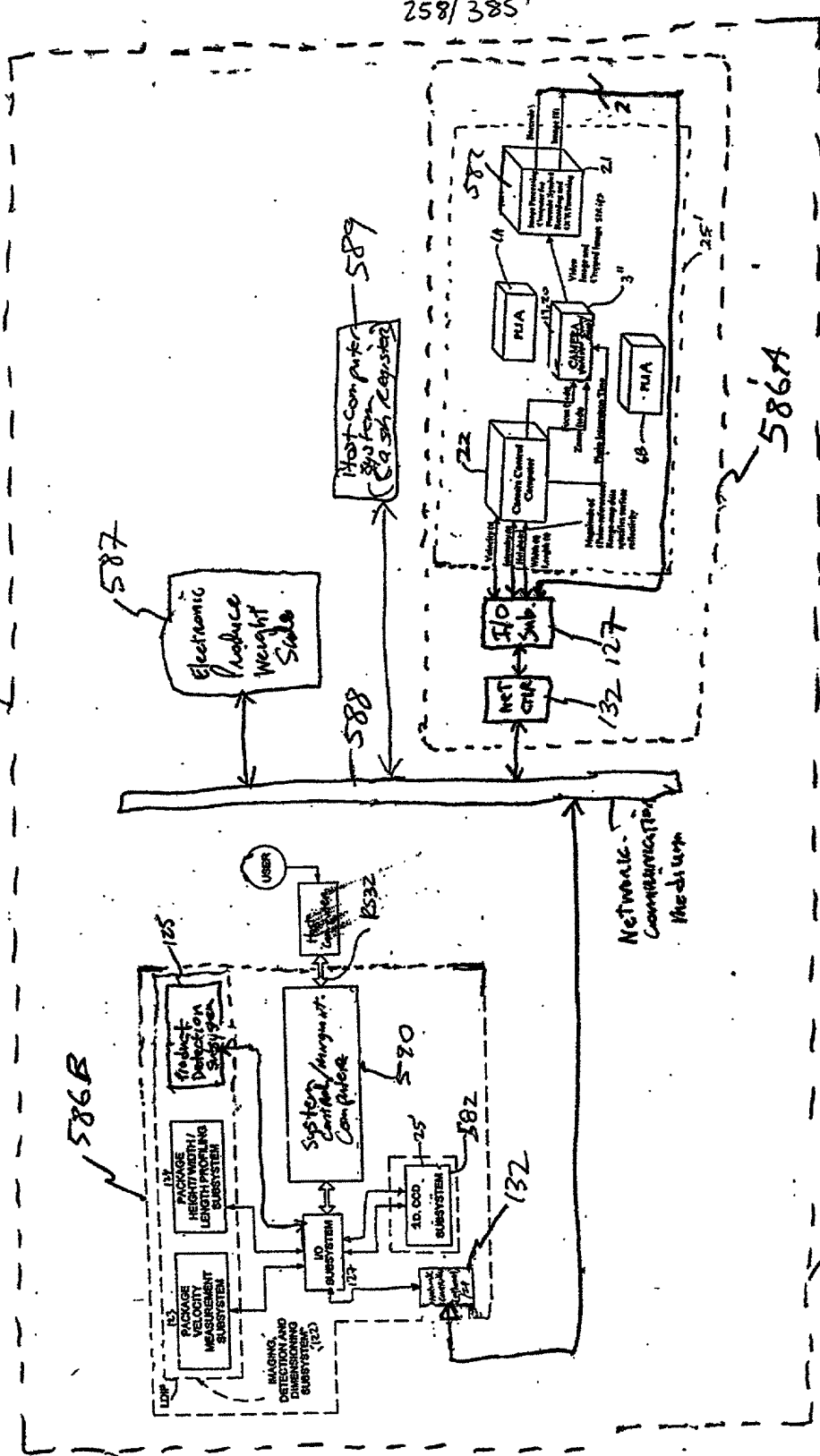
593

594

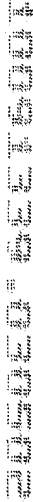
595

586A

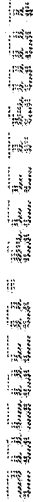
FIG. 33C



姓名	性别	年龄	籍贯	职业	住址	电话	备注
王德胜	男	35	山东	教师	北京路123号	1234	
李秀英	女	28	江苏	护士	文化路456号	5678	
张国强	男	42	河南	工人	建设路789号	9012	
刘小红	女	22	四川	学生	大学路321号	2345	
陈为民	男	38	湖北	医生	健康路654号	3456	
赵子龙	男	50	陕西	干部	政府路987号	4567	
孙丽娟	女	30	浙江	会计	商业路109号	5678	
周大伟	男	25	安徽	记者	新闻路210号	6789	
吴小芳	女	20	江西	歌手	音乐路321号	7890	
郑长龙	男	45	湖南	工程师	科技路432号	8901	
冯美玲	女	27	福建	设计师	创意路543号	9012	
马建军	男	33	山西	农民	农村路654号	0123	
徐海燕	女	24	广东	模特	时尚路765号	1234	
郭子豪	男	31	广西	律师	法律路876号	2345	
梁小华	女	29	云南	导游	旅游路987号	3456	
周国强	男	40	贵州	商人	商业路098号	4567	
吴丽娟	女	26	海南	教师	教育路109号	5678	
郑为民	男	37	重庆	工人	工业路210号	6789	
孙小芳	女	21	四川	学生	大学路321号	7890	
马长龙	男	48	湖北	干部	政府路432号	8901	
徐美玲	女	23	浙江	会计	商业路543号	9012	
郭建军	男	34	安徽	记者	新闻路654号	0123	
梁小华	女	28	江西	歌手	音乐路765号	1234	
周大伟	男	39	湖南	工程师	科技路876号	2345	
吴丽娟	女	25	福建	设计师	创意路987号	3456	
郑为民	男	41	山西	农民	农村路098号	4567	
孙小芳	女	22	广东	模特	时尚路109号	5678	
马长龙	男	46	广西	律师	法律路210号	6789	
徐美玲	女	27	云南	导游	旅游路321号	7890	
郭建军	男	36	贵州	商人	商业路432号	8901	
梁小华	女	29	海南	教师	教育路543号	9012	
周大伟	男	43	重庆	工人	工业路654号	0123	
吴丽娟	女	24	四川	学生	大学路765号	1234	
郑为民	男	44	湖北	干部	政府路876号	2345	
孙小芳	女	26	浙江	会计	商业路987号	3456	
马长龙	男	47	安徽	记者	新闻路098号	4567	
徐美玲	女	28	江西	歌手	音乐路109号	5678	
郭建军	男	38	湖南	工程师	科技路210号	6789	
梁小华	女	30	福建	设计师	创意路321号	7890	
周大伟	男	49	山西	农民	农村路432号	8901	
吴丽娟	女	25	广东	模特	时尚路543号	9012	
郑为民	男	42	广西	律师	法律路654号	0123	
孙小芳	女	23	云南	导游	旅游路765号	1234	
马长龙	男	45	贵州	商人	商业路876号	2345	
徐美玲	女	27	海南	教师	教育路987号	3456	
郭建军	男	37	重庆	工人	工业路098号	4567	
梁小华	女	31	四川	学生	大学路109号	5678	
周大伟	男	50	湖北	干部	政府路210号	6789	
吴丽娟	女	29	浙江	会计	商业路321号	7890	
郑为民	男	43	安徽	记者	新闻路432号	8901	
孙小芳	女	24	江西	歌手	音乐路543号	9012	
马长龙	男	46	湖南	工程师	科技路654号	0123	
徐美玲	女	28	福建	设计师	创意路765号	1234	
郭建军	男	39	山西	农民	农村路876号	2345	
梁小华	女	32	广东	模特	时尚路987号	3456	
周大伟	男	51	广西	律师	法律路098号	4567	



姓名	性别	年龄	籍贯	职业	住址	电话	备注
王德胜	男	35	山东	教师	北京路123号	1234	
李秀英	女	28	江苏	护士	文化路456号	5678	
张国强	男	42	河南	工人	建设路789号	9012	
刘小红	女	22	四川	学生	大学路321号	2345	
陈为民	男	38	湖北	医生	健康路654号	3456	
赵子龙	男	50	陕西	干部	政府路987号	4567	
孙丽娟	女	30	浙江	会计	商业路109号	5678	
周大伟	男	25	广东	程序员	科技路210号	6789	
吴小芳	女	20	湖南	歌手	音乐路321号	7890	
郑为民	男	45	安徽	工程师	工业路432号	8901	
冯小梅	女	27	江西	记者	新闻路543号	9012	
马国强	男	33	山西	农民	农村路654号	0123	
宋小红	女	24	福建	设计师	创意路765号	1234	
周大伟	男	29	广西	司机	交通路876号	2345	
吴小芳	女	21	云南	舞蹈家	艺术路987号	3456	
郑为民	男	48	贵州	教授	学术路098号	4567	
冯小梅	女	26	海南	模特	时尚路109号	5678	
马国强	男	31	重庆	厨师	美食路210号	6789	
宋小红	女	23	四川	画家	画廊路321号	7890	
周大伟	男	36	湖北	律师	法律路432号	8901	
吴小芳	女	25	湖南	作家	文学路543号	9012	
郑为民	男	41	安徽	科学家	科研路654号	0123	
冯小梅	女	28	江西	歌手	音乐路765号	1234	
马国强	男	34	山西	工人	工厂路876号	2345	
宋小红	女	22	福建	学生	大学路987号	3456	
周大伟	男	39	广西	干部	政府路098号	4567	
吴小芳	女	27	云南	护士	医院路109号	5678	
郑为民	男	43	贵州	教师	学校路210号	6789	
冯小梅	女	24	海南	会计	公司路321号	7890	
马国强	男	32	重庆	程序员	科技路432号	8901	
宋小红	女	21	四川	歌手	音乐路543号	9012	
周大伟	男	37	湖北	工程师	工业路654号	0123	
吴小芳	女	26	湖南	记者	新闻路765号	1234	
郑为民	男	44	安徽	农民	农村路876号	2345	
冯小梅	女	29	江西	设计师	创意路987号	3456	
马国强	男	30	山西	司机	交通路098号	4567	
宋小红	女	23	福建	舞蹈家	艺术路109号	5678	
周大伟	男	38	广西	教授	学术路210号	6789	
吴小芳	女	25	云南	模特	时尚路321号	7890	
郑为民	男	46	贵州	厨师	美食路432号	8901	
冯小梅	女	27	海南	画家	画廊路543号	9012	
马国强	男	35	重庆	律师	法律路654号	0123	
宋小红	女	22	四川	作家	文学路765号	1234	
周大伟	男	40	湖北	科学家	科研路876号	2345	
吴小芳	女	28	湖南	歌手	音乐路987号	3456	
郑为民	男	42	安徽	工人	工厂路098号	4567	
冯小梅	女	24	江西	学生	大学路109号	5678	
马国强	男	33	山西	干部	政府路210号	6789	
宋小红	女	21	福建	护士	医院路321号	7890	
周大伟	男	36	广西	教师	学校路432号	8901	
吴小芳	女	26	云南	会计	公司路543号	9012	
郑为民	男	47	贵州	程序员	科技路654号	0123	
冯小梅	女	29	海南	歌手	音乐路765号	1234	
马国强	男	31	重庆	工程师	工业路876号	2345	
宋小红	女	23	四川	记者	新闻路987号	3456	
周大伟	男	39	湖北	农民	农村路098号	4567	
吴小芳</							



姓名	性别	年龄	籍贯	职业	住址	电话	备注
王德胜	男	35	山东	教师	北京路123号	1234	
李秀英	女	28	江苏	护士	文化路456号	5678	
张国强	男	42	河南	工人	建设路789号	9012	
刘小红	女	22	四川	学生	大学路321号	2345	
陈为民	男	38	湖北	医生	健康路654号	3456	
赵子龙	男	50	陕西	干部	政府路987号	4567	
孙丽娟	女	30	浙江	会计	商业路210号	5678	
周大伟	男	45	安徽	工程师	科技路543号	6789	
吴小芳	女	25	江西	记者	新闻路876号	7890	
郑长庚	男	55	湖南	教授	学院路109号	8901	
冯雅婷	女	20	广东	歌手	音乐路432号	9012	
黄志坚	男	40	广西	农民	农村路765号	0123	
徐美玲	女	33	福建	作家	文学路098号	1234	
郭子豪	男	27	山西	程序员	IT路321号	2345	
林小燕	女	31	河北	模特	时尚路654号	3456	
罗国强	男	48	四川	商人	商业路987号	4567	
苏婉婷	女	24	湖北	舞蹈家	艺术路210号	5678	
周大平	男	52	湖南	教授	大学路543号	6789	
吴小华	女	29	广东	设计师	创意路876号	7890	
郑长明	男	58	广西	干部	政府路109号	8901	
冯雅莉	女	21	安徽	歌手	音乐路432号	9012	
黄志强	男	41	江西	工人	工厂路765号	0123	
徐美娟	女	34	福建	作家	文学路098号	1234	
郭子豪	男	26	山西	程序员	IT路321号	2345	
林小燕	女	32	河北	模特	时尚路654号	3456	
罗国强	男	49	四川	商人	商业路987号	4567	
苏婉婷	女	25	湖北	舞蹈家	艺术路210号	5678	
周大平	男	53	湖南	教授	大学路543号	6789	
吴小华	女	30	广东	设计师	创意路876号	7890	
郑长明	男	59	广西	干部	政府路109号	8901	
冯雅莉	女	22	安徽	歌手	音乐路432号	9012	
黄志强	男	42	江西	工人	工厂路765号	0123	
徐美娟	女	35	福建	作家	文学路098号	1234	
郭子豪	男	27	山西	程序员	IT路321号	2345	
林小燕	女	33	河北	模特	时尚路654号	3456	
罗国强	男	50	四川	商人	商业路987号	4567	
苏婉婷	女	26	湖北	舞蹈家	艺术路210号	5678	
周大平	男	54	湖南	教授	大学路543号	6789	
吴小华	女	31	广东	设计师	创意路876号	7890	
郑长明	男	60	广西	干部	政府路109号	8901	
冯雅莉	女	23	安徽	歌手	音乐路432号	9012	
黄志强	男	43	江西	工人	工厂路765号	0123	
徐美娟	女	36	福建	作家	文学路098号	1234	
郭子豪	男	28	山西	程序员	IT路321号	2345	
林小燕	女	34	河北	模特	时尚路654号	3456	
罗国强	男	51	四川	商人	商业路987号	4567	
苏婉婷	女	27	湖北	舞蹈家	艺术路210号	5678	
周大平	男	55	湖南	教授	大学路543号	6789	
吴小华	女	32	广东	设计师	创意路876号	7890	
郑长明	男	61	广西	干部	政府路109号	8901	
冯雅莉	女	24	安徽	歌手	音乐路432号	9012	
黄志强	男	44	江西	工人	工厂路765号	0123	
徐美娟	女	37	福建	作家	文学路098号	1234	
郭子豪	男	29	山西	程序员	IT路321号	2345	
林小燕	女	35	河北	模特	时尚路654号	3456	
罗国强	男	52	四川	商人	商业路987号	4567</	

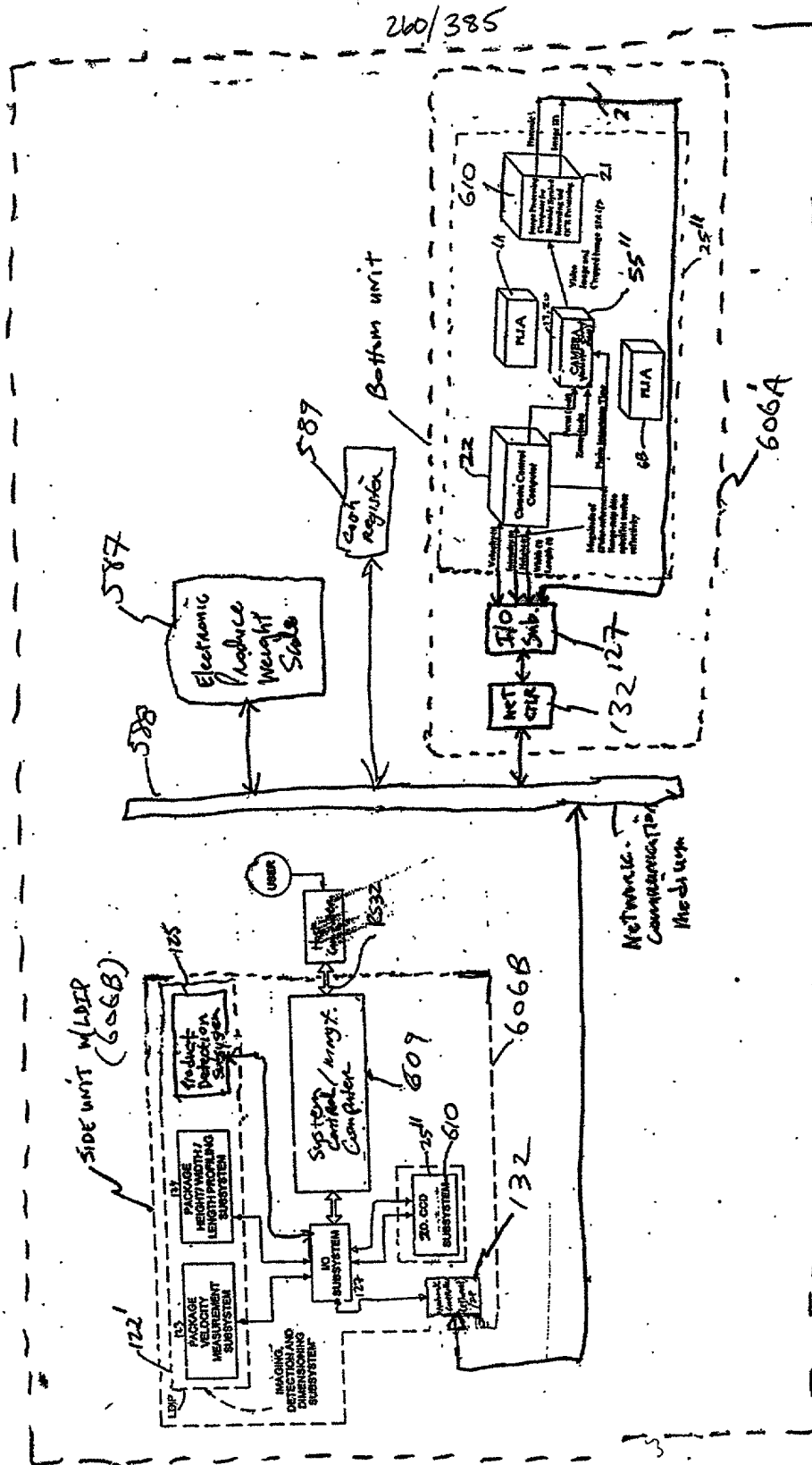
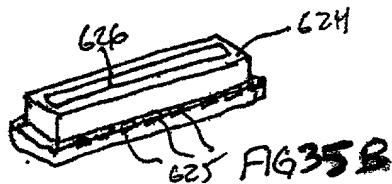
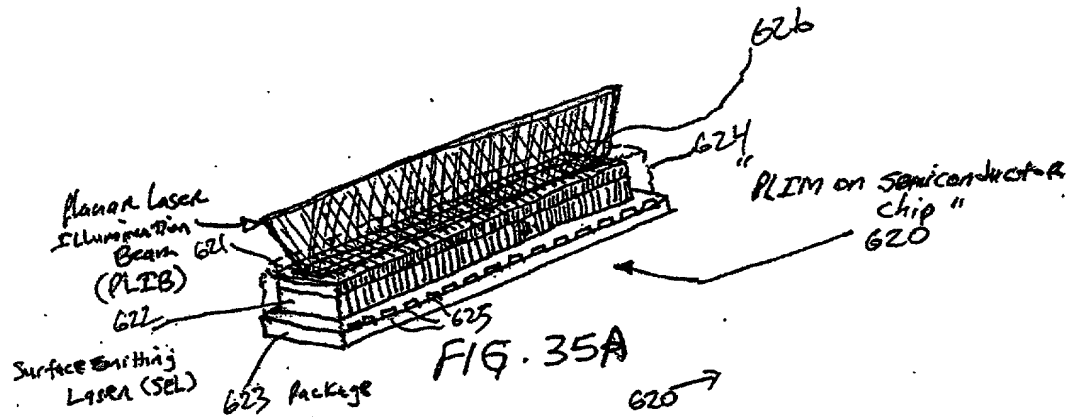


FIG. 34C



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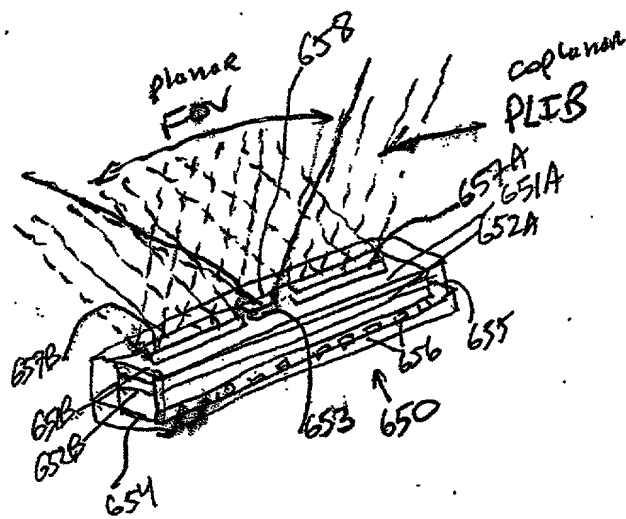


FIG. 37

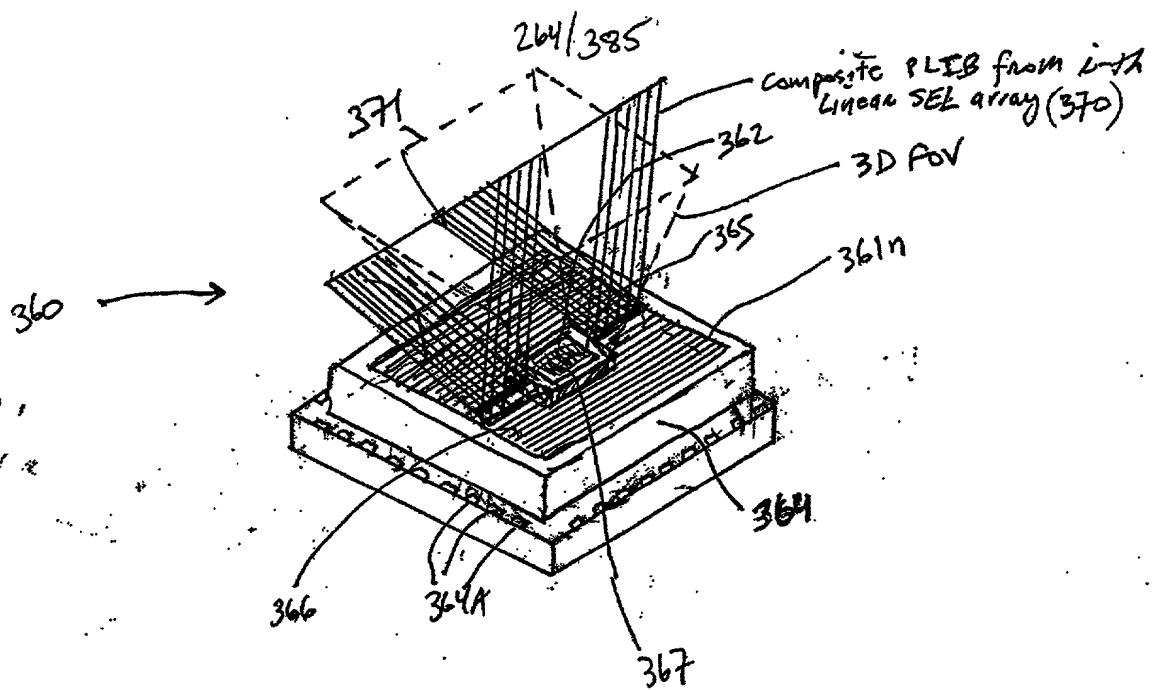


FIG. 38A

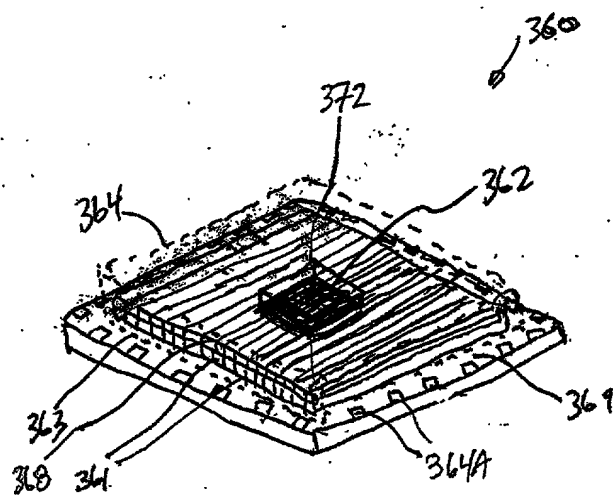


FIG. 38B

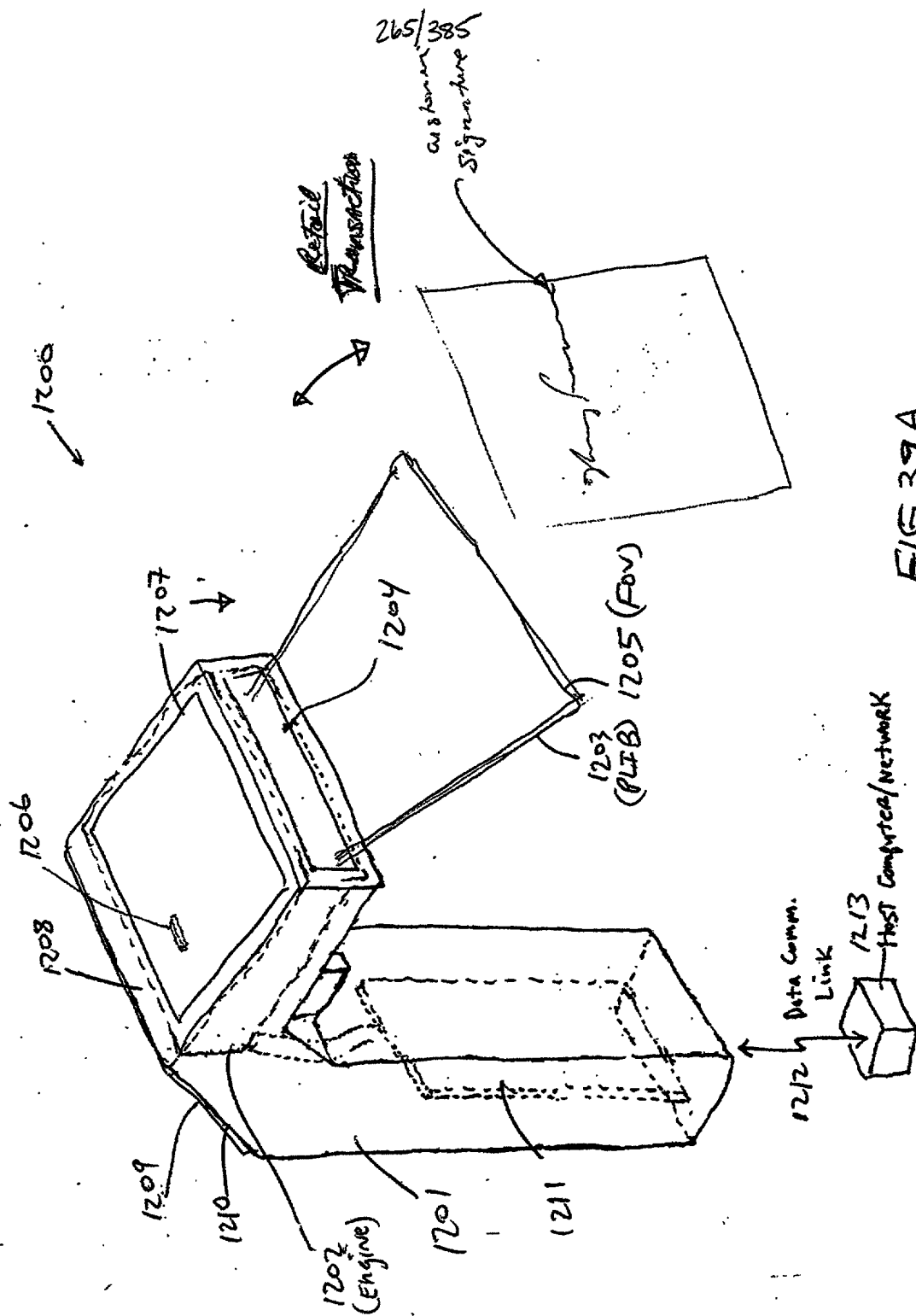


FIG. 39A

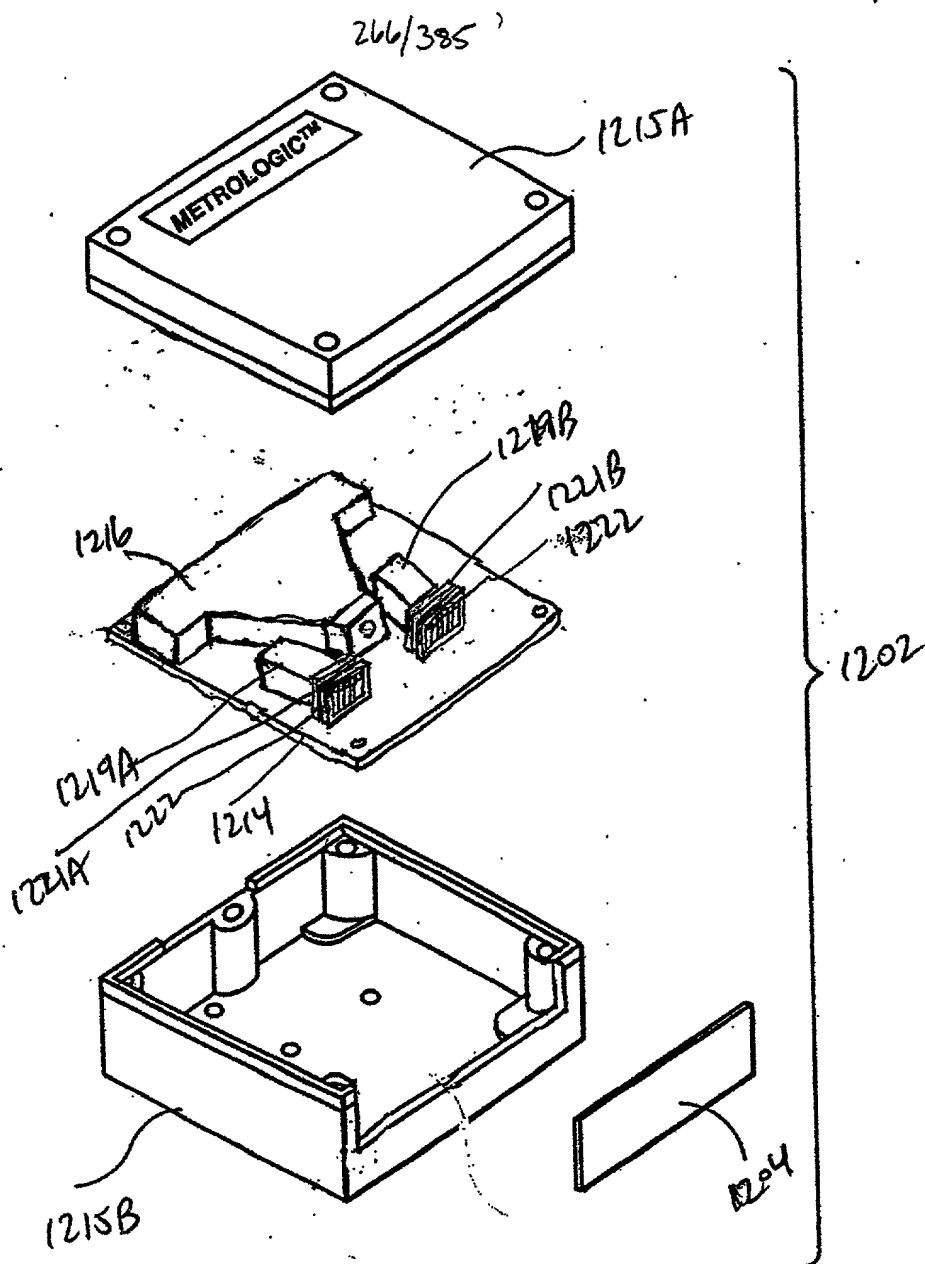


FIG. 39B

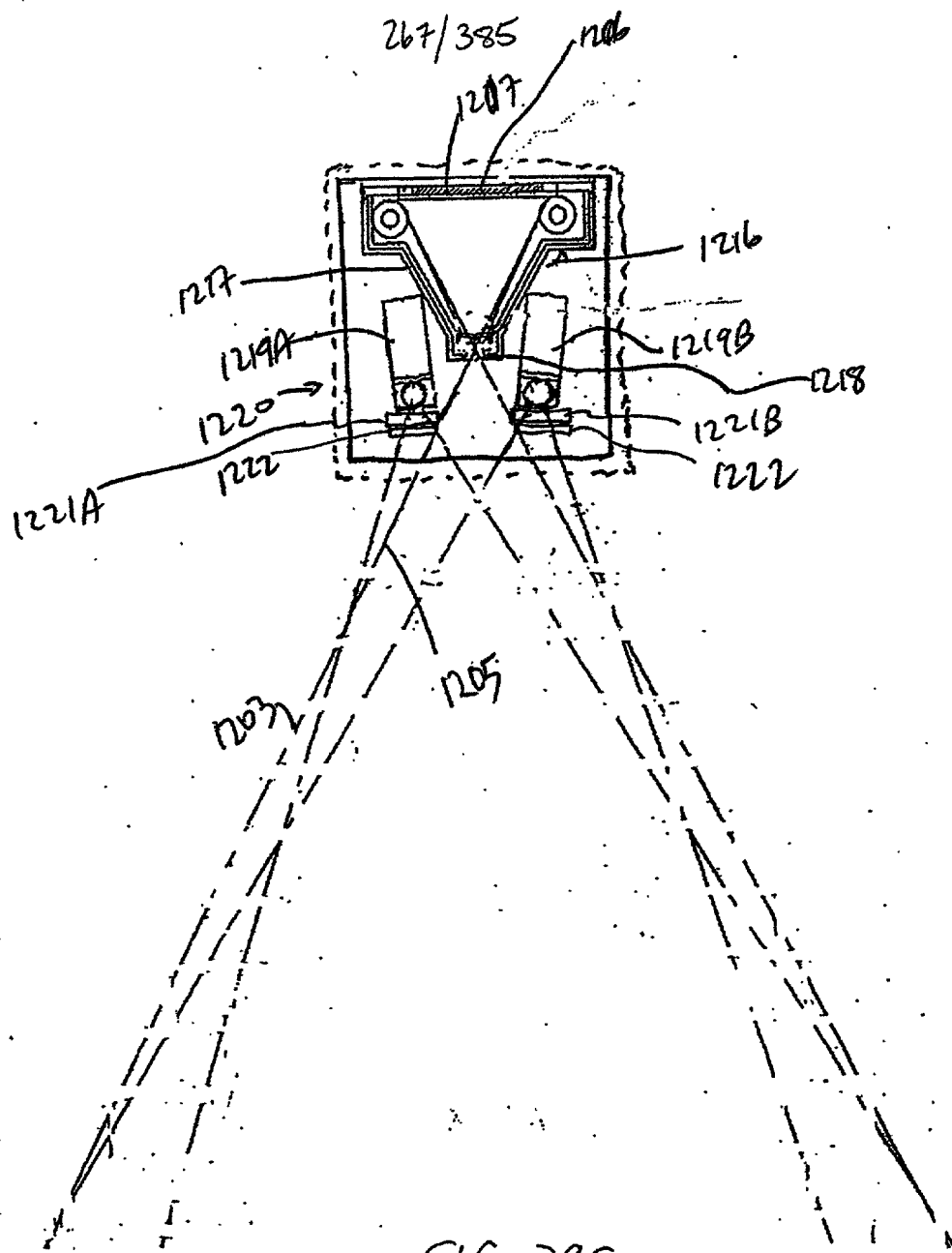


FIG. 39C

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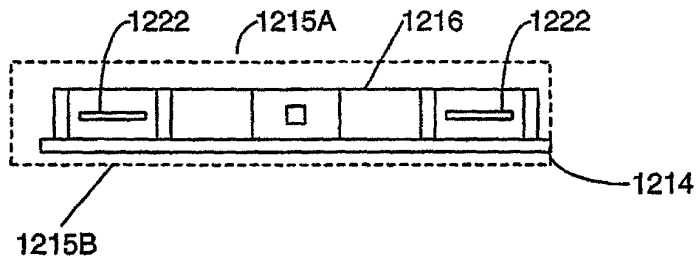


FIG. 39D

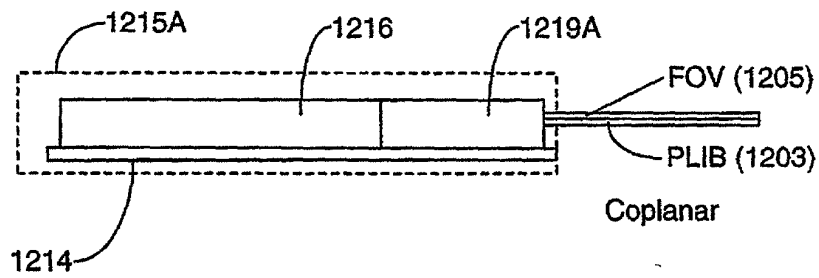


FIG. 39E



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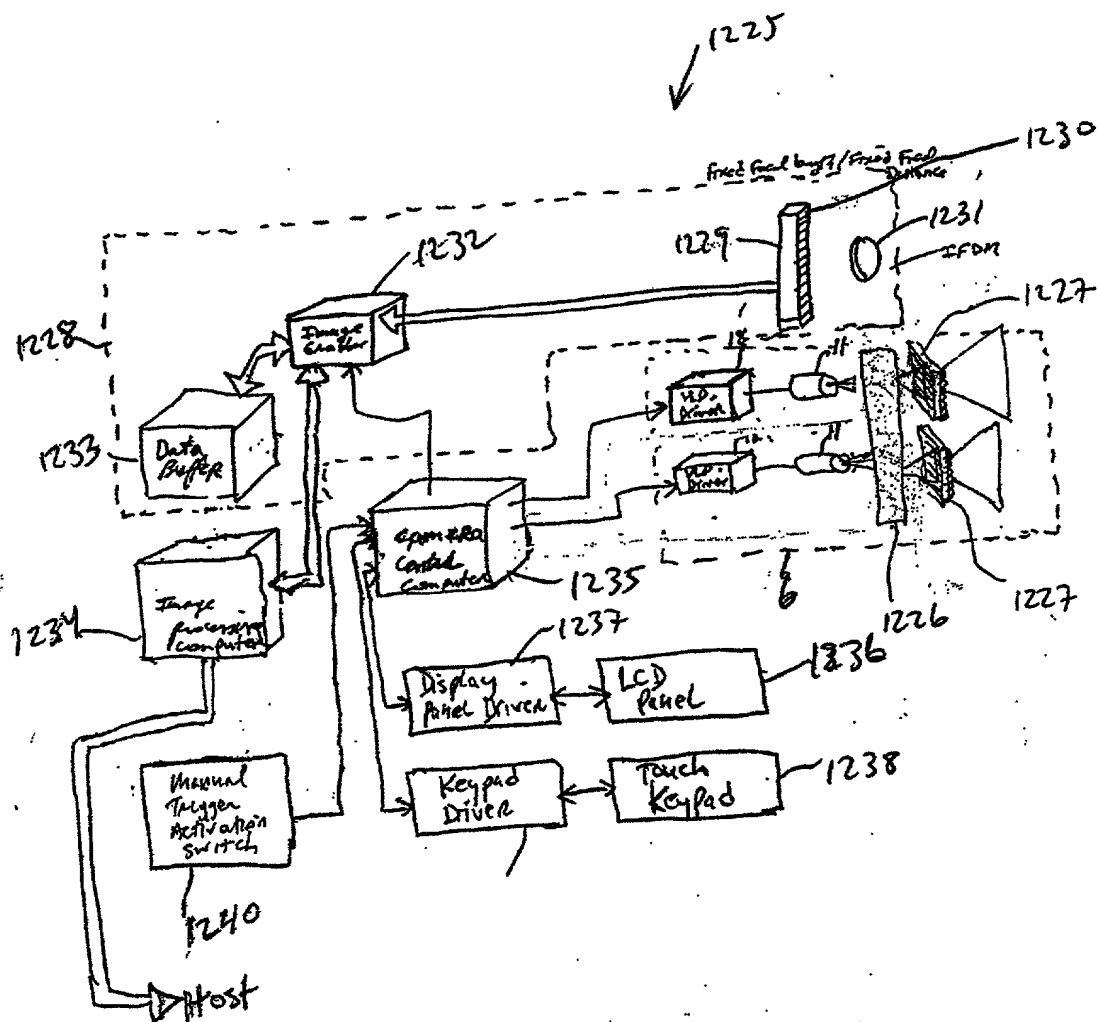
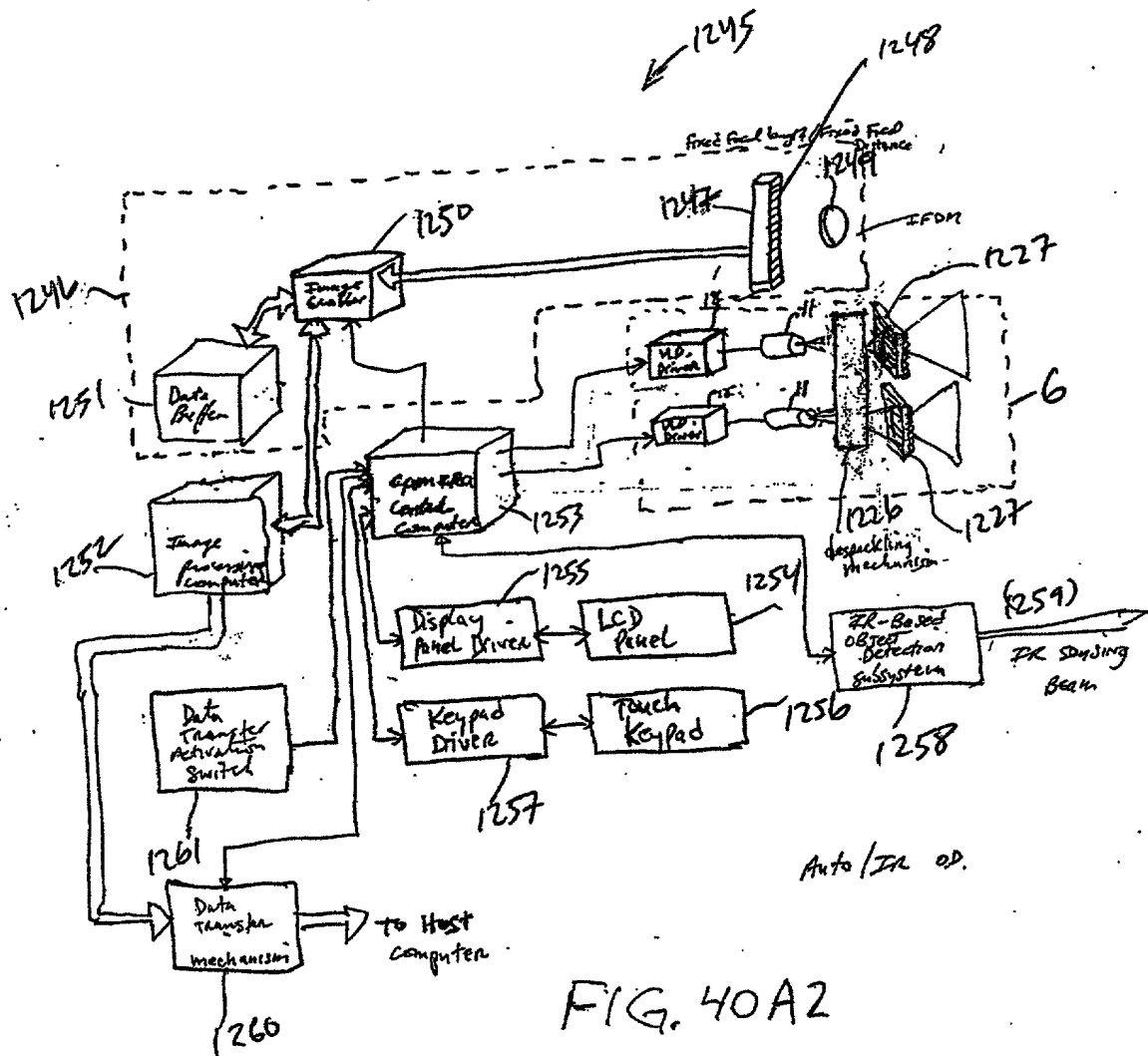


FIG. 40A1

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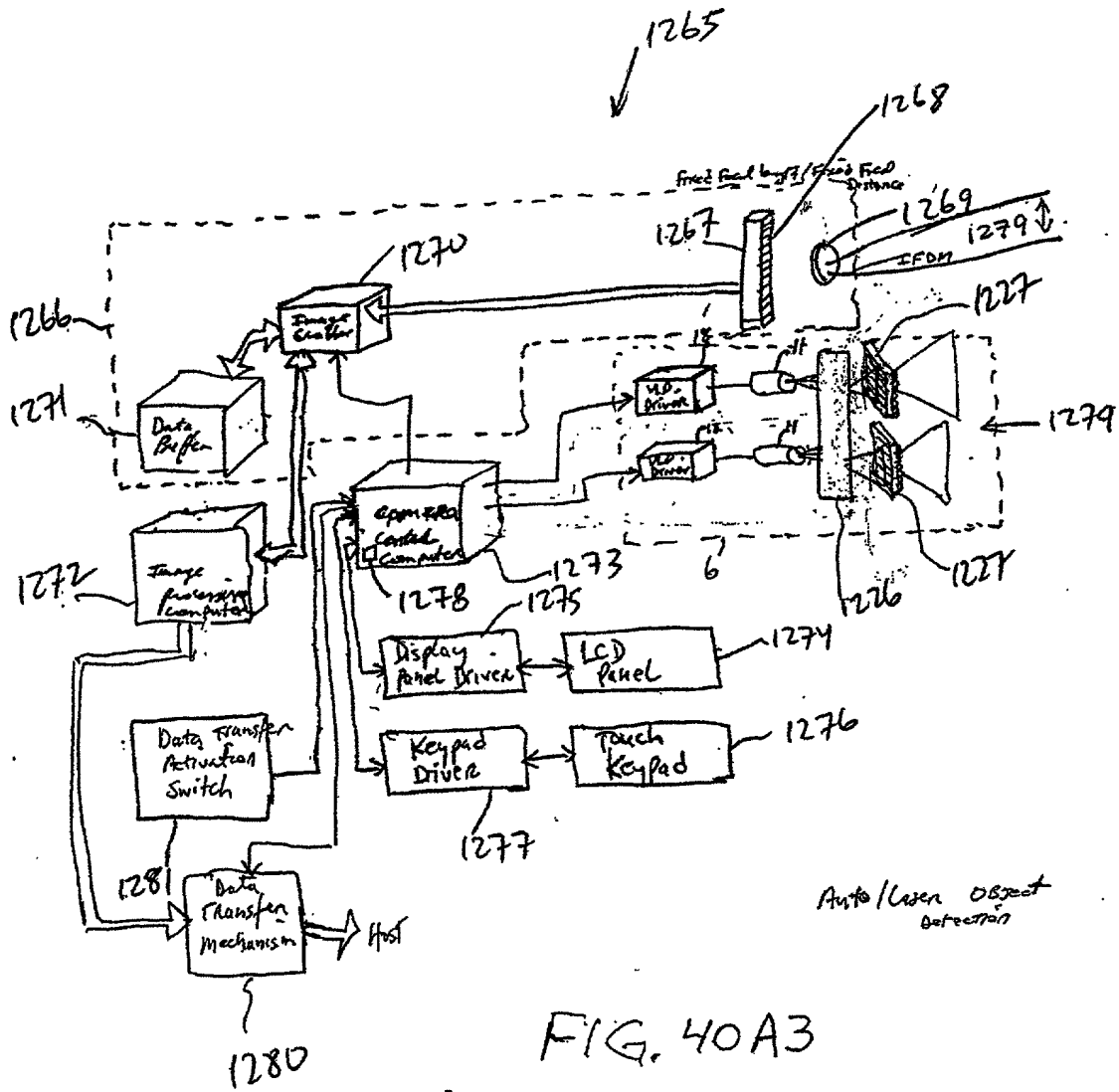


FIG. 40A3

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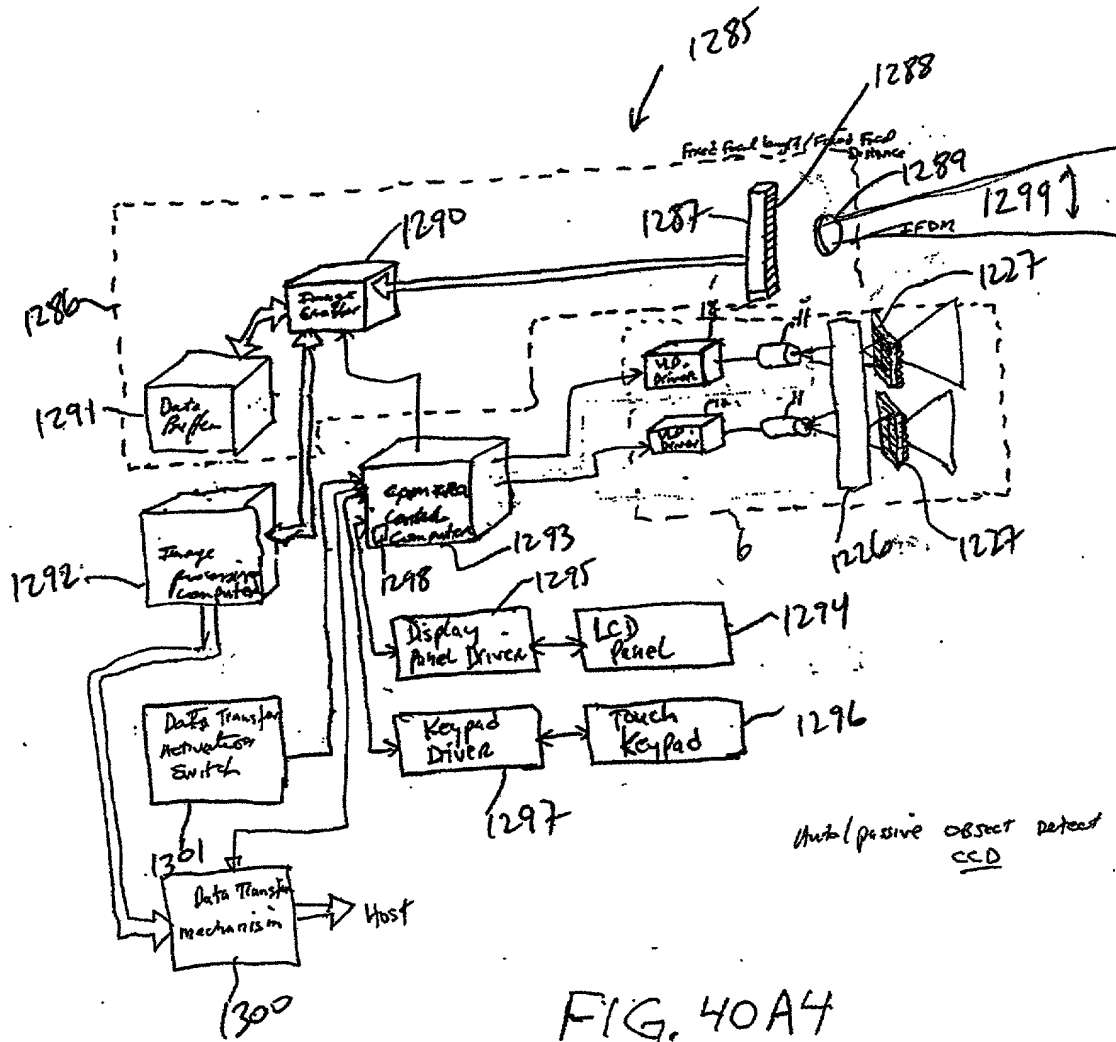


FIG. 40A4

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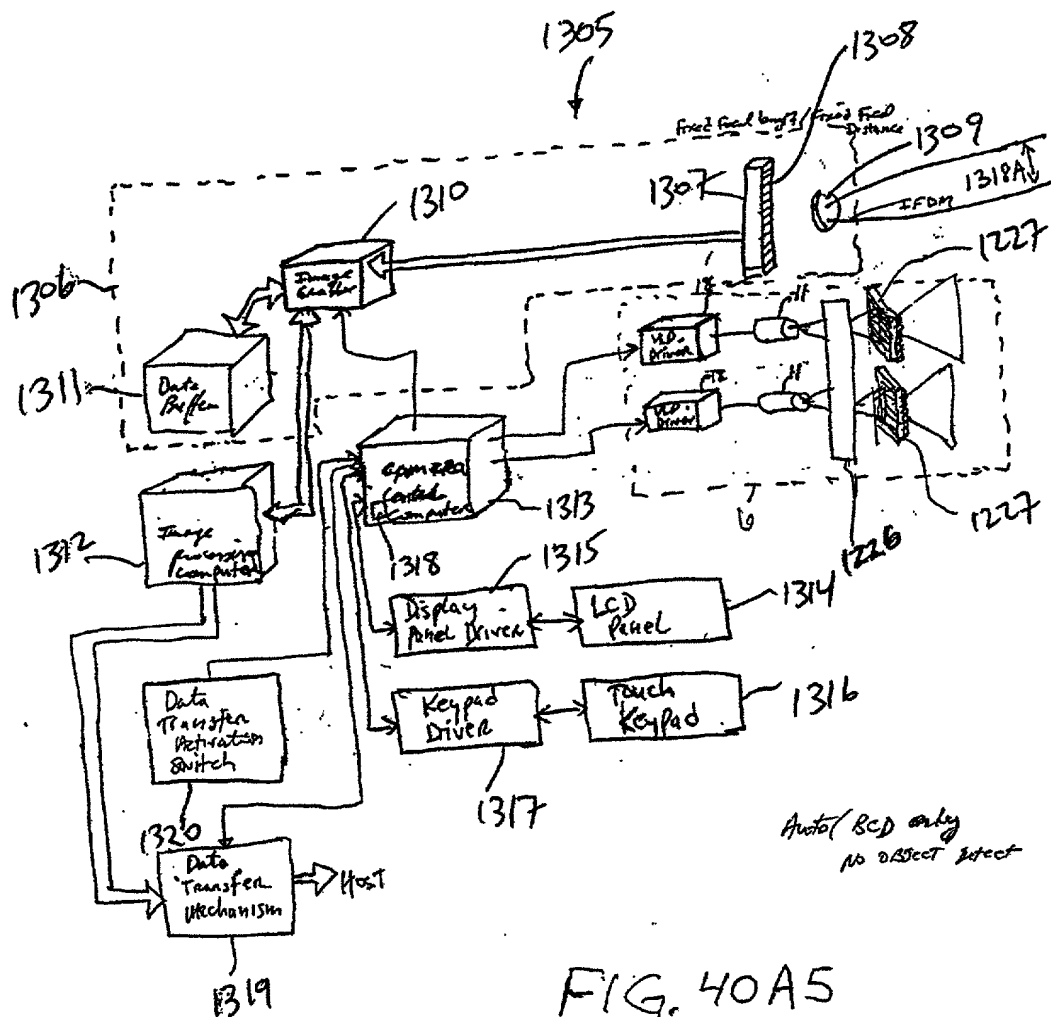


FIG. 40A5

—



FIG. 40B1

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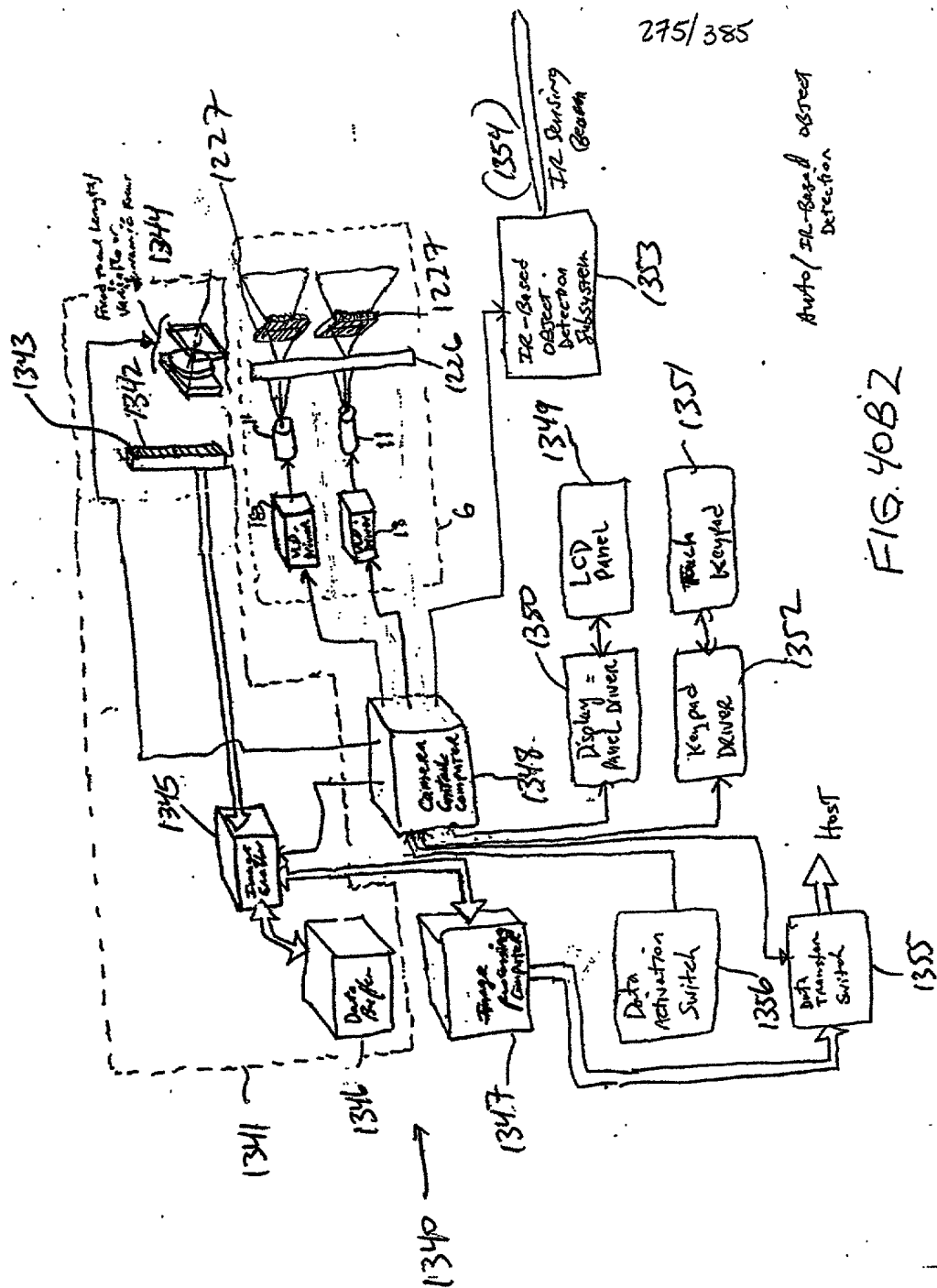


FIG. 40B2

Auto/IR-Based object detection

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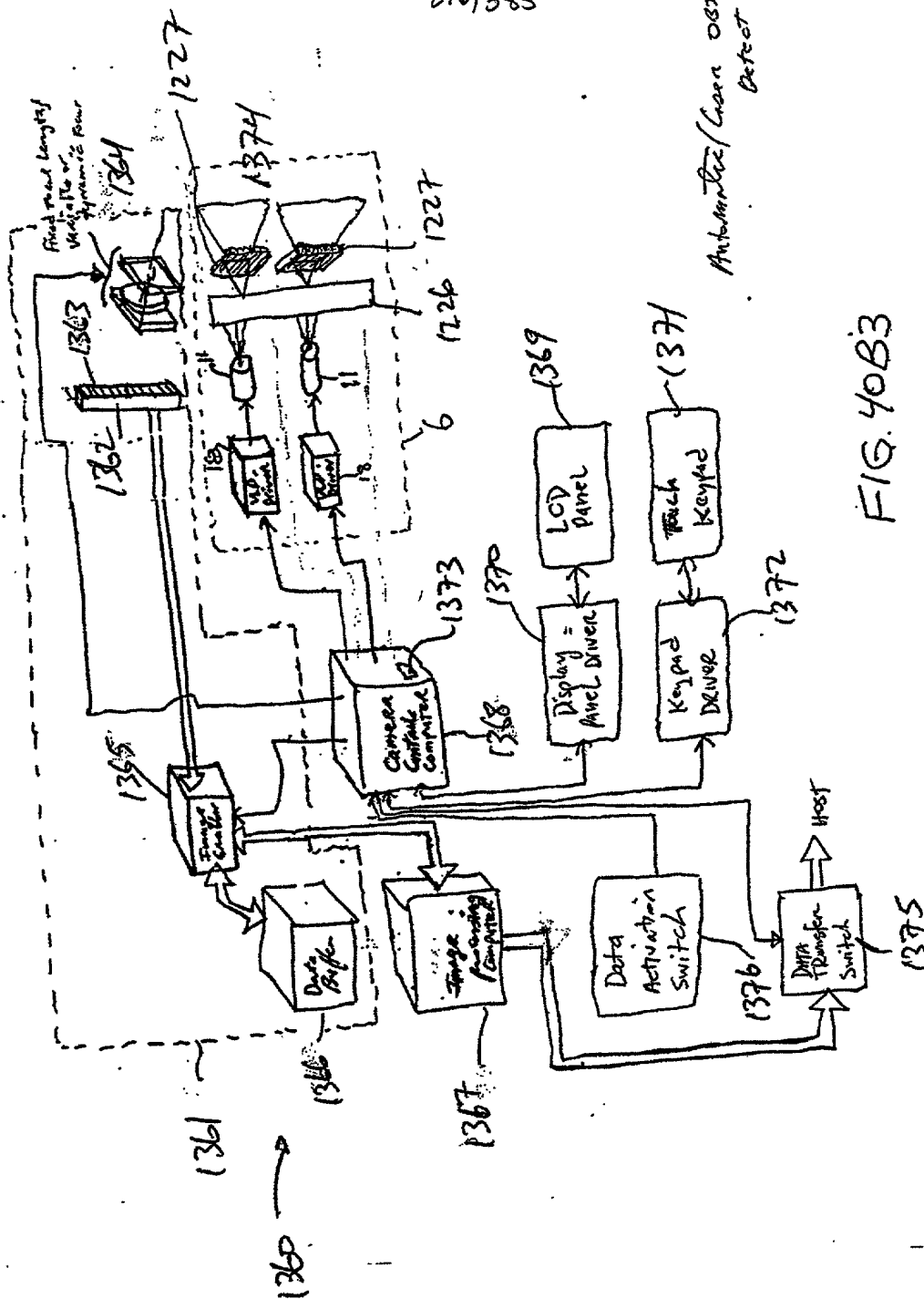
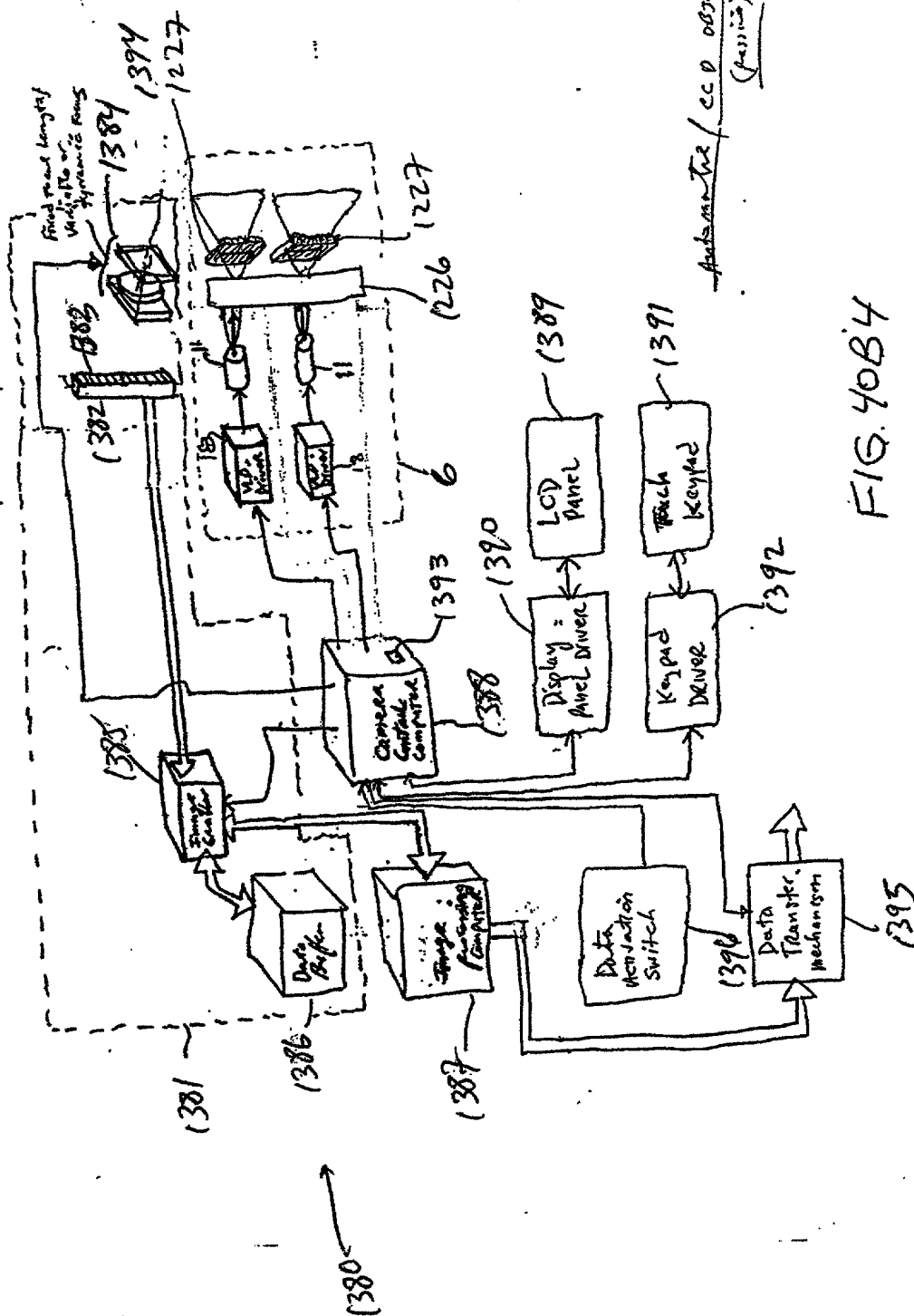


FIG. 40B3

Automatic/Manual Object Detect



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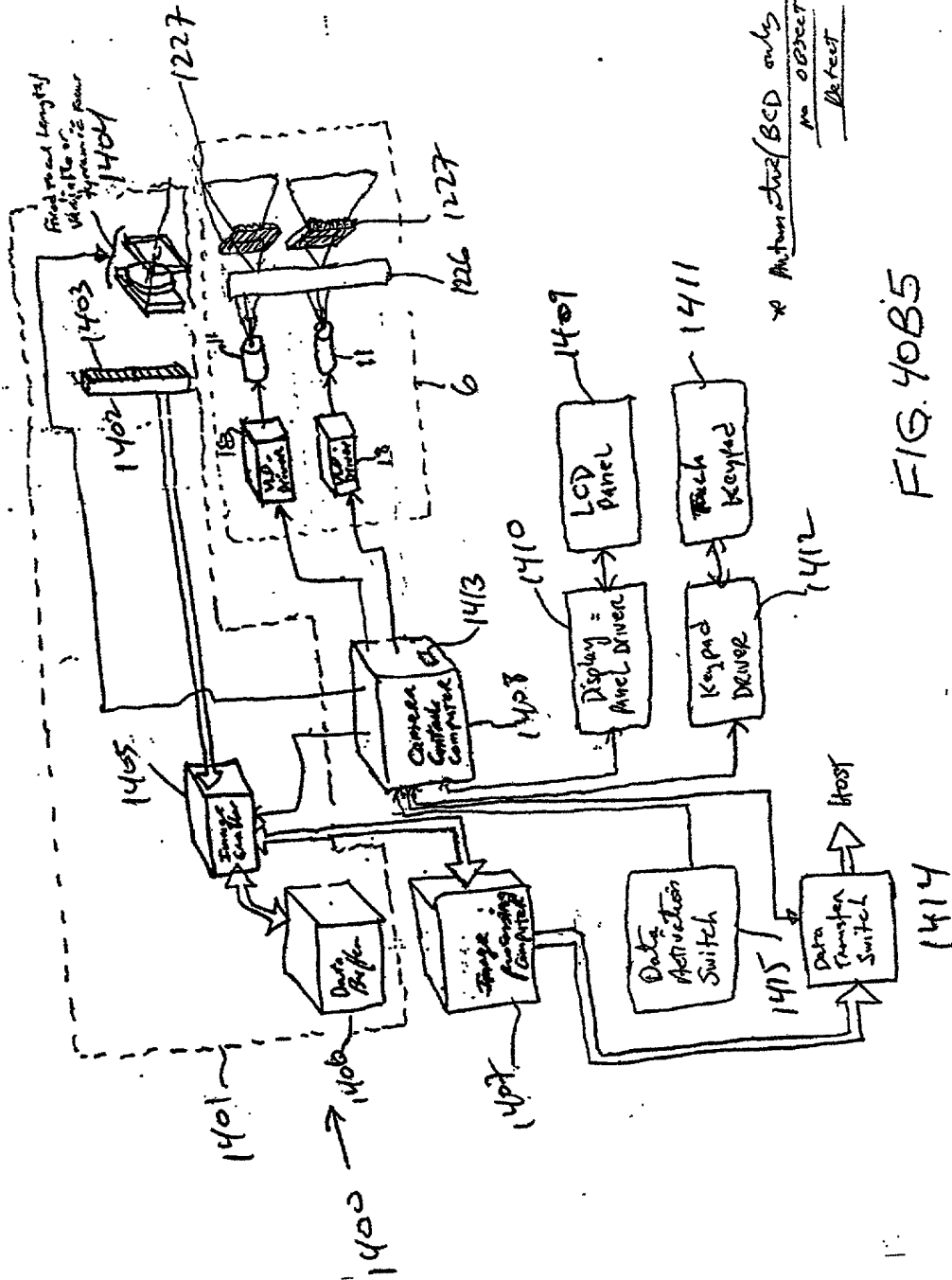
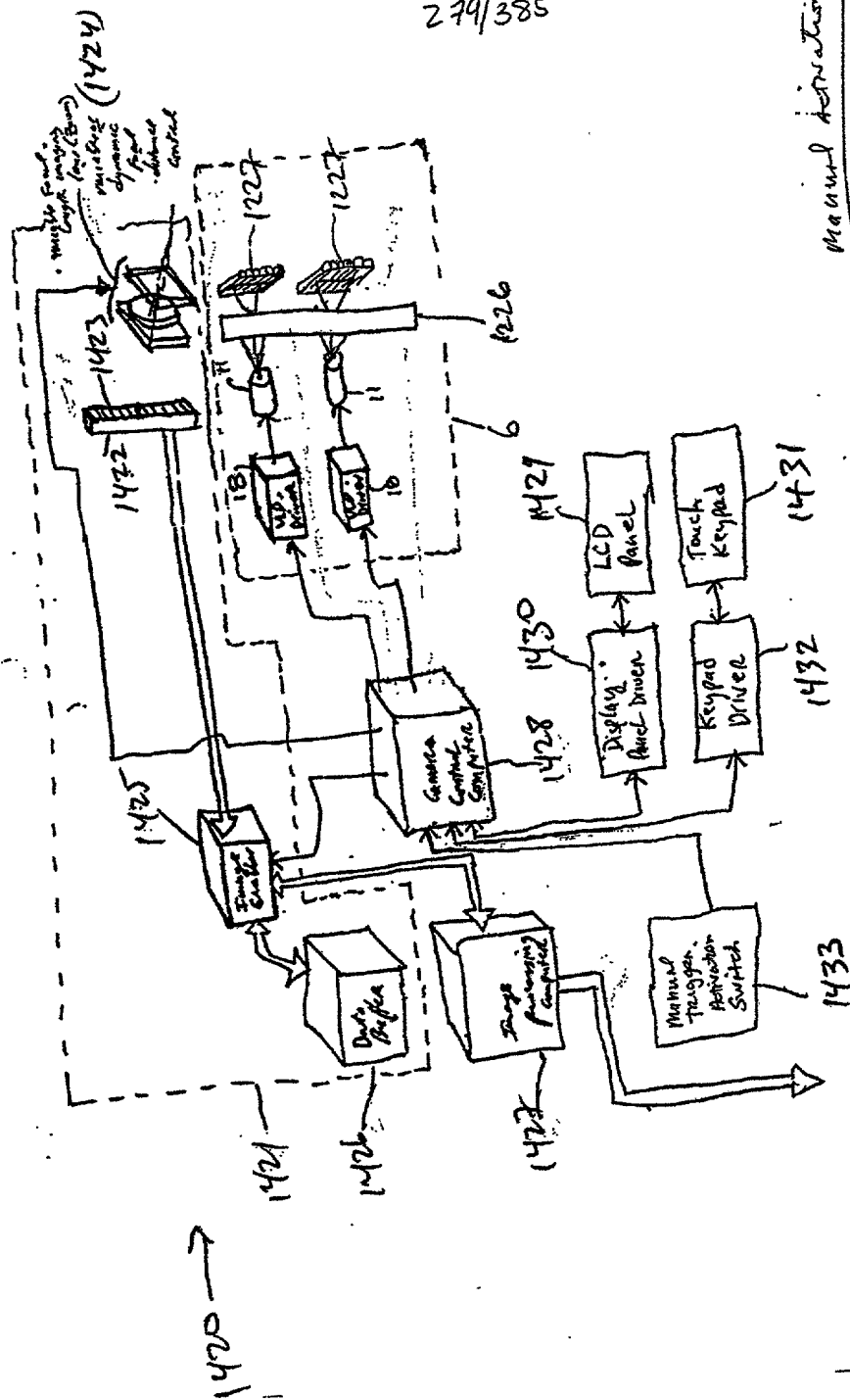


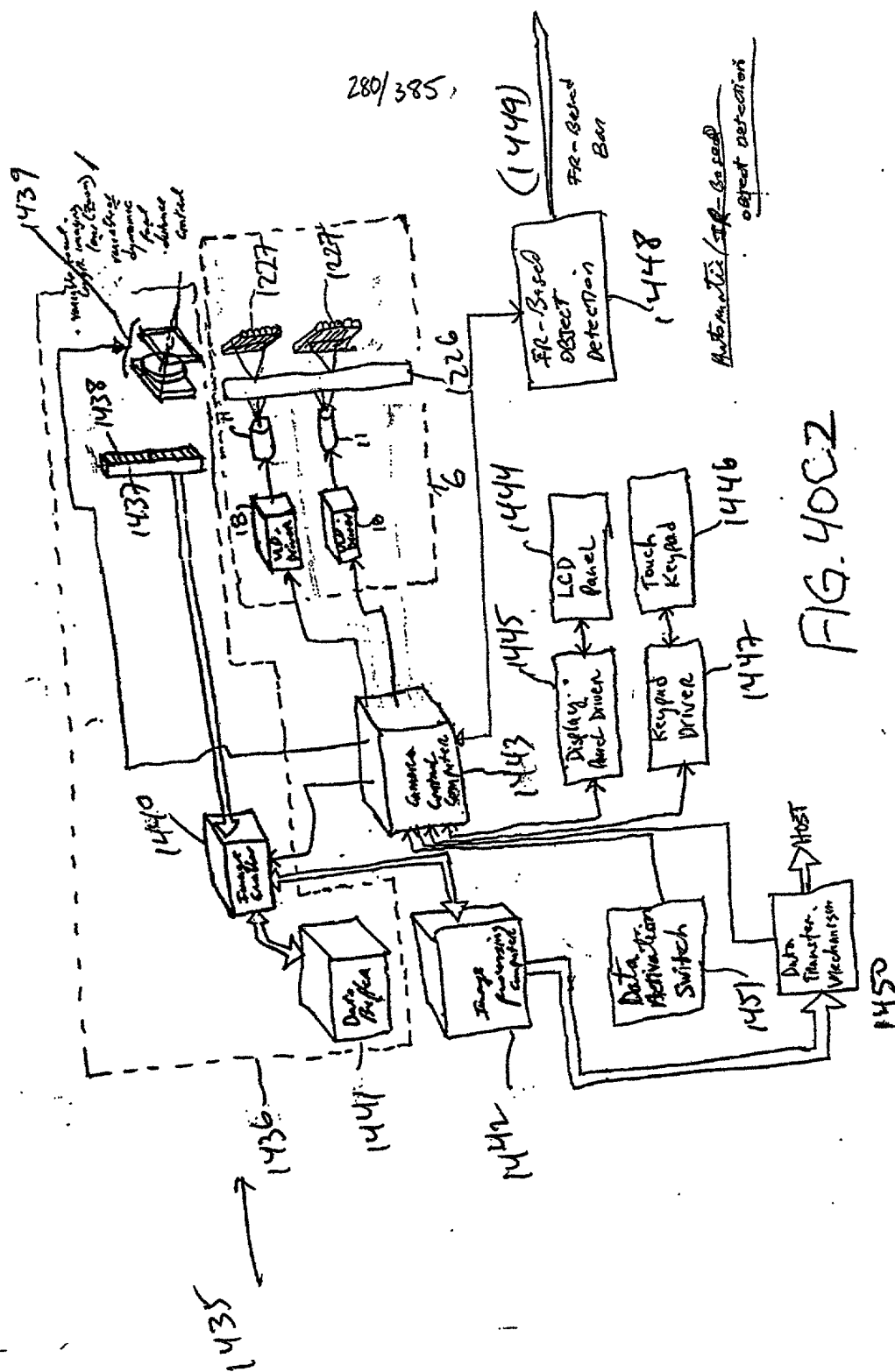
FIG. 40B5

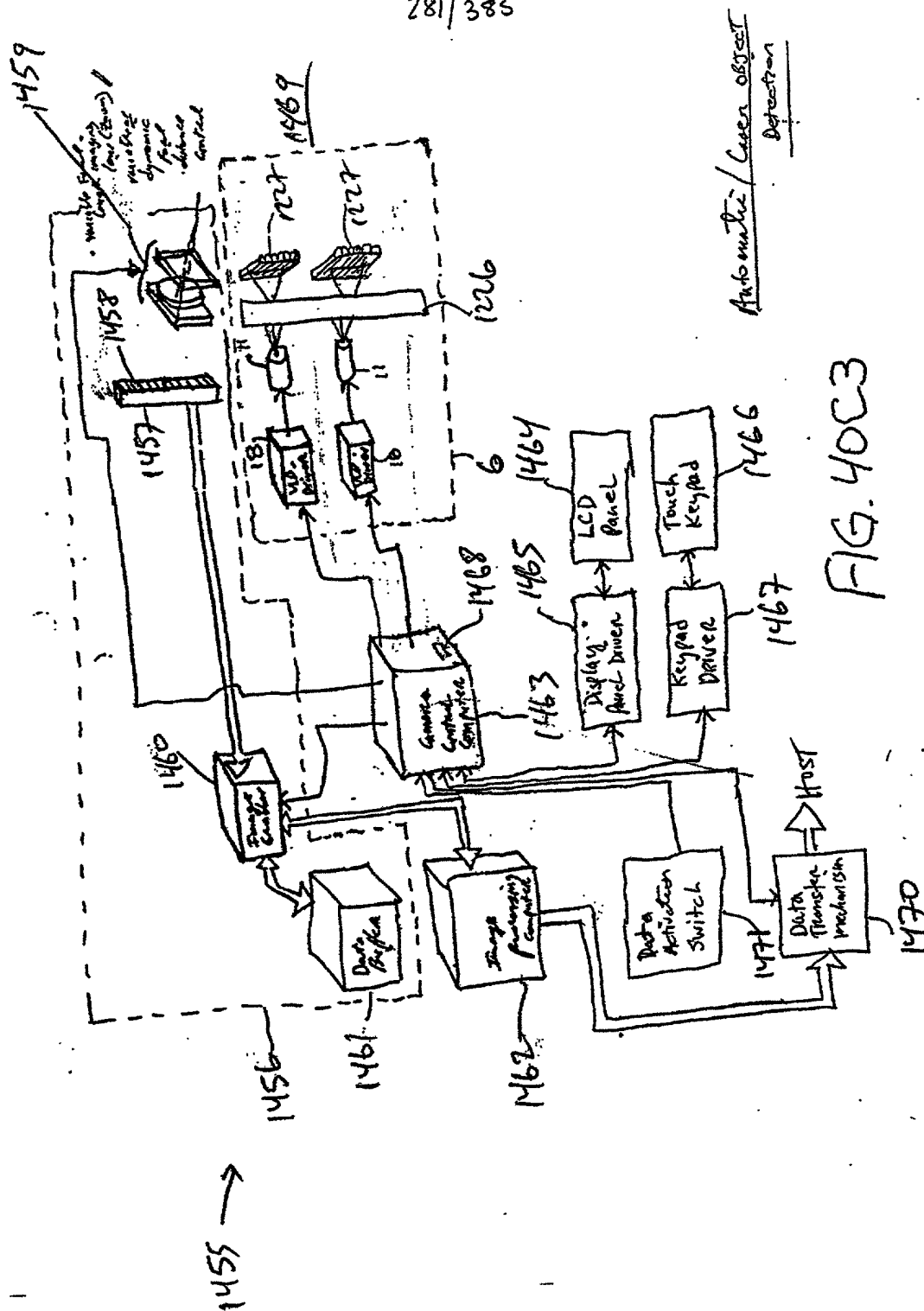
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Manual navigation

FIG. 40C1





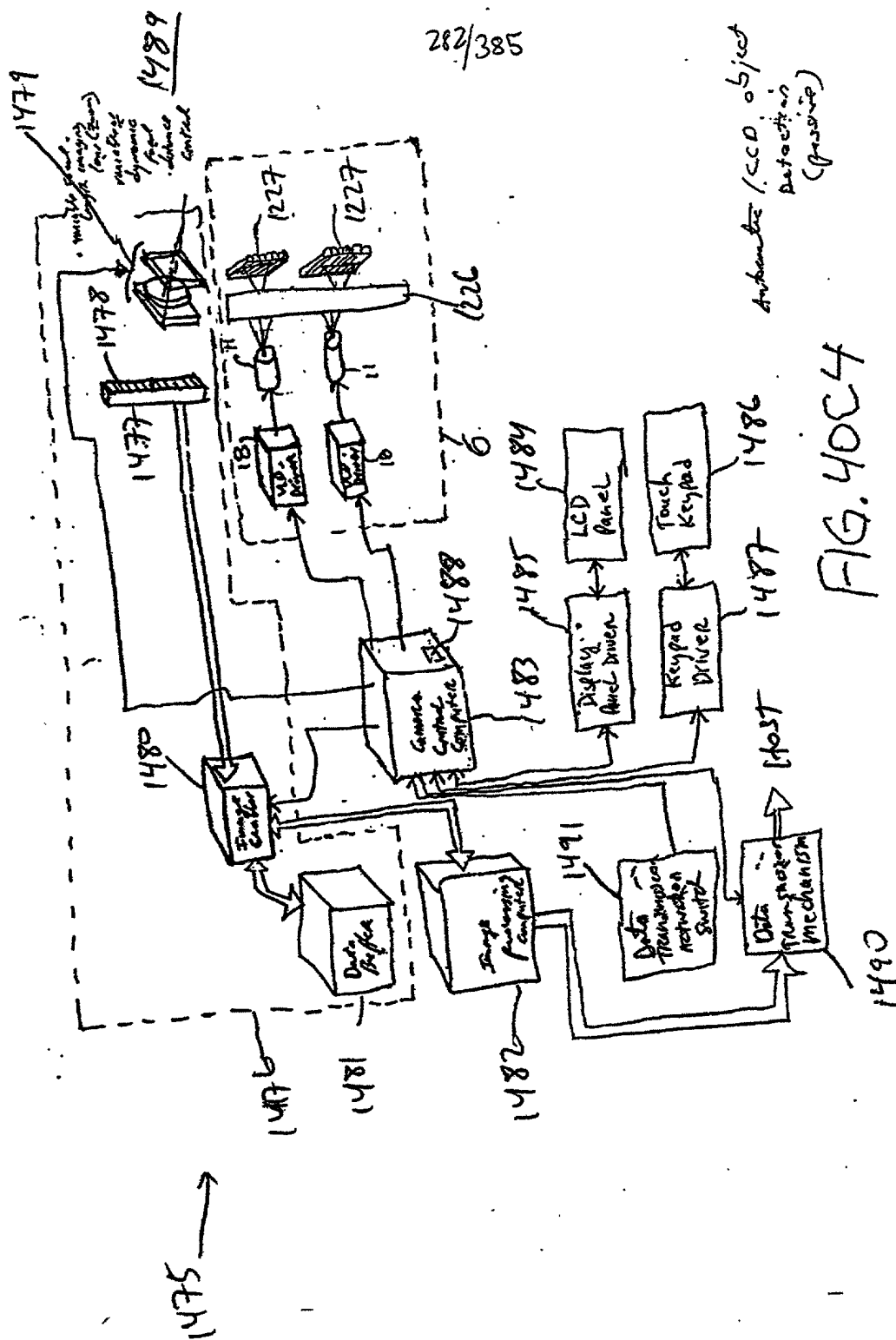
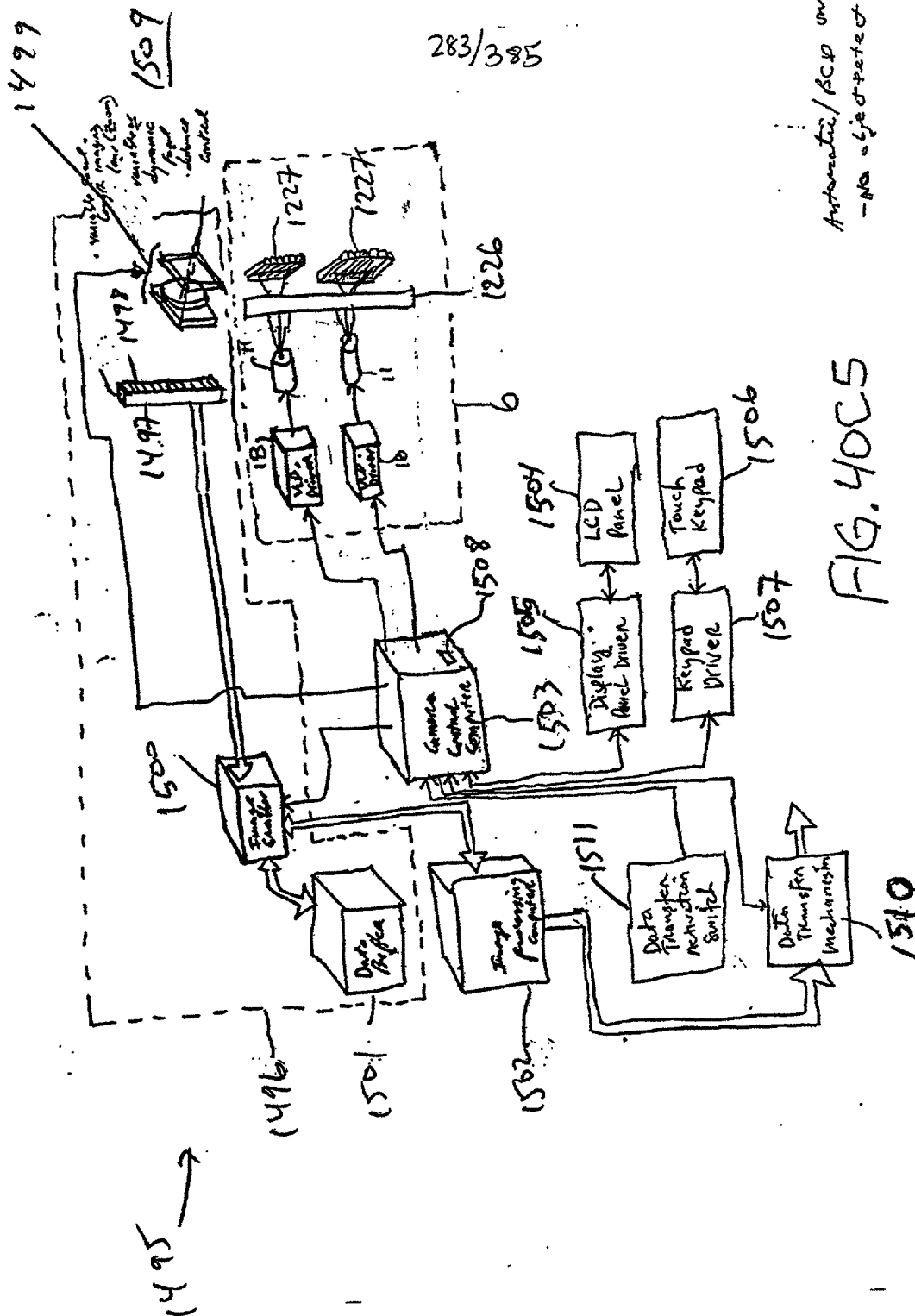


FIG. 40C5



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1-D  
display  
...

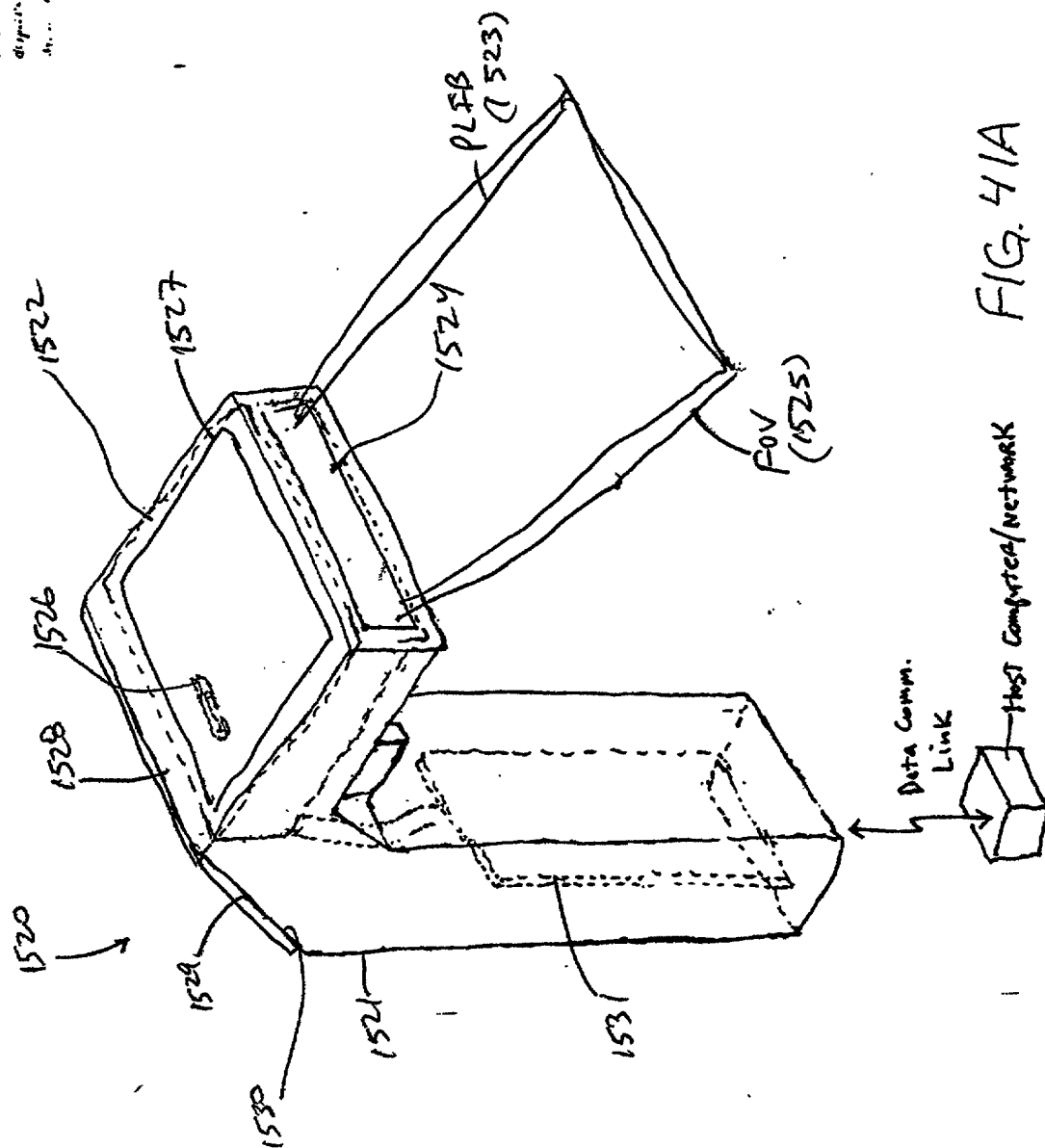


FIG. 41A



NAME	AGE	RELATION	DATE	PLACE	REMARKS
John Smith	25	Son	1880	London	1880
Mary Jones	22	Daughter	1881	London	1881
James Brown	30	Husband	1882	London	1882
Elizabeth White	28	Wife	1883	London	1883
William Black	35	Son	1884	London	1884
Ann Green	20	Daughter	1885	London	1885
Thomas Grey	40	Husband	1886	London	1886
Sarah Hall	38	Wife	1887	London	1887
Robert King	45	Son	1888	London	1888
Charlotte Lee	32	Daughter	1889	London	1889
George Young	50	Husband	1890	London	1890
Frances Olden	48	Wife	1891	London	1891
Henry Taylor	55	Son	1892	London	1892
Isabella Adams	42	Daughter	1893	London	1893
Charles Baker	60	Husband	1894	London	1894
Elizabeth Clark	58	Wife	1895	London	1895
William Evans	65	Son	1896	London	1896
Ann Foster	52	Daughter	1897	London	1897
Thomas Gibson	70	Husband	1898	London	1898
Sarah Harris	68	Wife	1899	London	1899
Robert Irving	75	Son	1900	London	1900
Charlotte Jones	62	Daughter	1901	London	1901
George King	80	Husband	1902	London	1902
Frances Lee	78	Wife	1903	London	1903
Henry Olden	85	Son	1904	London	1904
Isabella Taylor	72	Daughter	1905	London	1905
Charles Adams	90	Husband	1906	London	1906
Elizabeth Baker	88	Wife	1907	London	1907
William Clark	95	Son	1908	London	1908
Ann Evans	82	Daughter	1909	London	1909
Thomas Foster	100	Husband	1910	London	1910
Sarah Gibson	98	Wife	1911	London	1911
Robert Harris	105	Son	1912	London	1912
Charlotte Irving	102	Daughter	1913	London	1913
George Jones	110	Husband	1914	London	1914
Frances King	108	Wife	1915	London	1915
Henry Lee	115	Son	1916	London	1916
Isabella Olden	112	Daughter	1917	London	1917
Charles Taylor	120	Husband	1918	London	1918
Elizabeth Adams	118	Wife	1919	London	1919
William Baker	125	Son	1920	London	1920
Ann Clark	122	Daughter	1921	London	1921
Thomas Evans	130	Husband	1922	London	1922
Sarah Foster	128	Wife	1923	London	1923
Robert Gibson	135	Son	1924	London	1924
Charlotte Harris	132	Daughter	1925	London	1925
George Irving	140	Husband	1926	London	1926
Frances Jones	138	Wife	1927	London	1927
Henry King	145	Son	1928	London	1928
Isabella Lee	142	Daughter	1929	London	1929
Charles Olden	150	Husband	1930	London	1930
Elizabeth Taylor	148	Wife	1931	London	1931
William Adams	155	Son	1932	London	1932
Ann Baker	152	Daughter	1933	London	1933
Thomas Clark	160	Husband	1934	London	1934
Sarah Evans	158	Wife	1935	London	1935
Robert Foster	165	Son	1936	London	1936
Charlotte Gibson	162	Daughter	1937	London	1937
George Harris	170	Husband	1938	London	1938
Frances Irving	168	Wife	1939	London	1939
Henry Jones	175	Son	1940	London	1940
Isabella King	172	Daughter	1941	London	1941
Charles Lee	180	Husband	1942	London	1942
Elizabeth Olden	178	Wife	1943	London	1943
William Taylor	185	Son	1944	London	1944
Ann Adams	182	Daughter	1945	London	1945
Thomas Baker	190	Husband	1946	London	1946
Sarah Clark	188	Wife	1947	London	1947
Robert Evans	195	Son	1948	London	1948
Charlotte Foster					

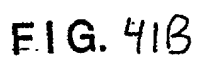


FIG. 41B

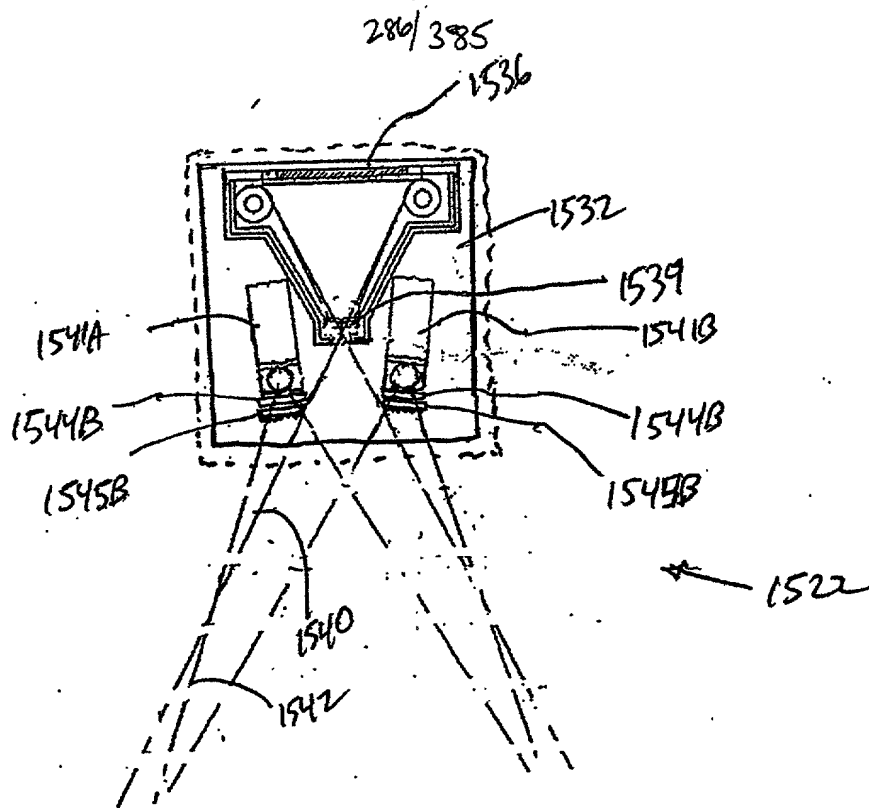


FIG. 41C

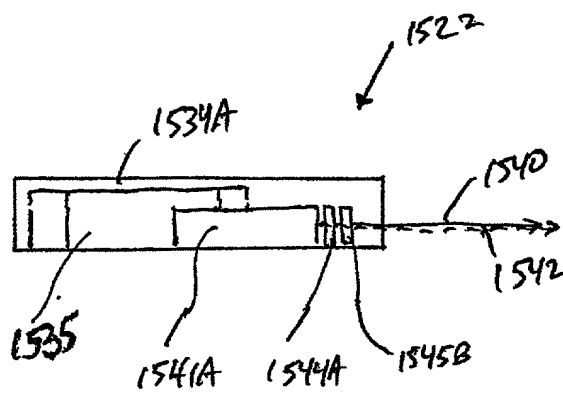
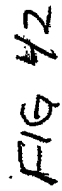


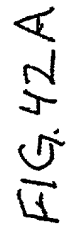
FIG. 41D

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Host Computer/Network

1. D  
despotic,  
v. 10



1567 Host Computer/Network

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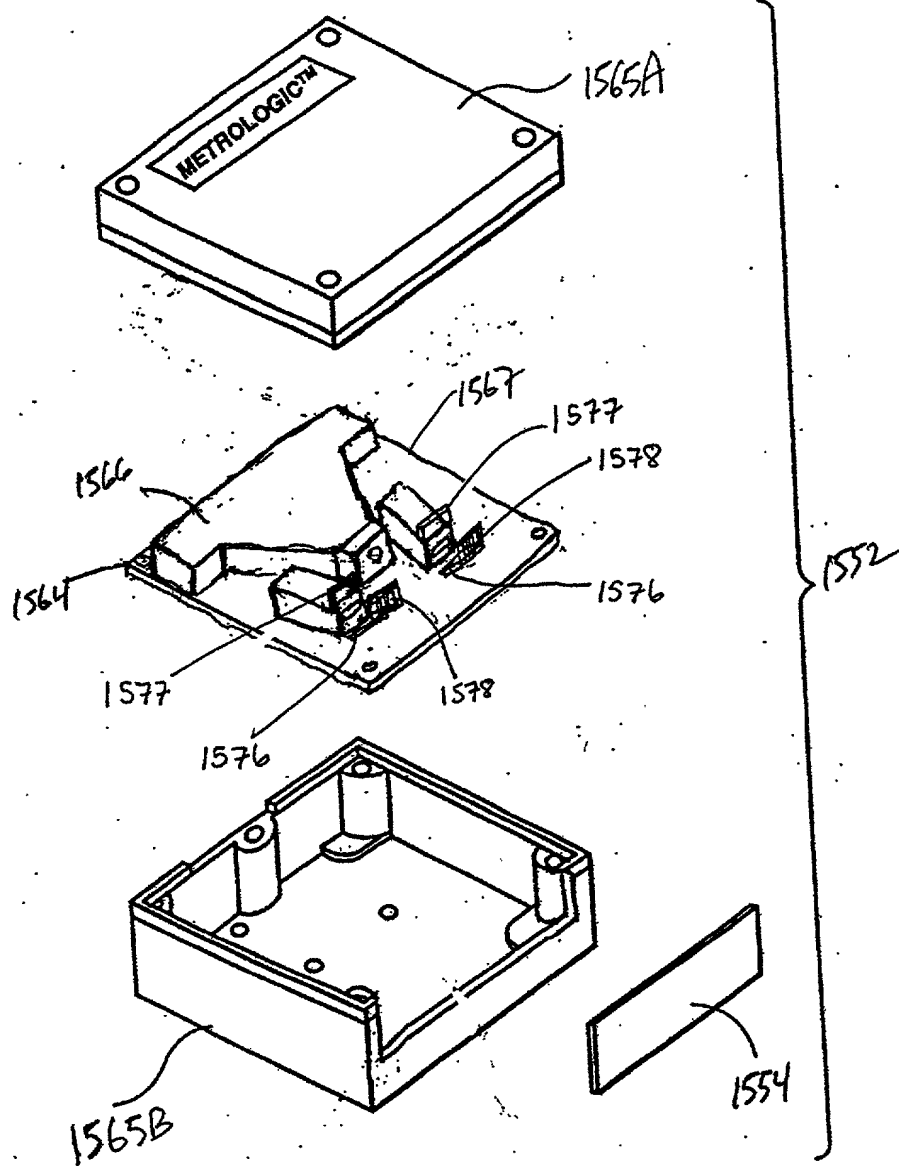


FIG. 42B

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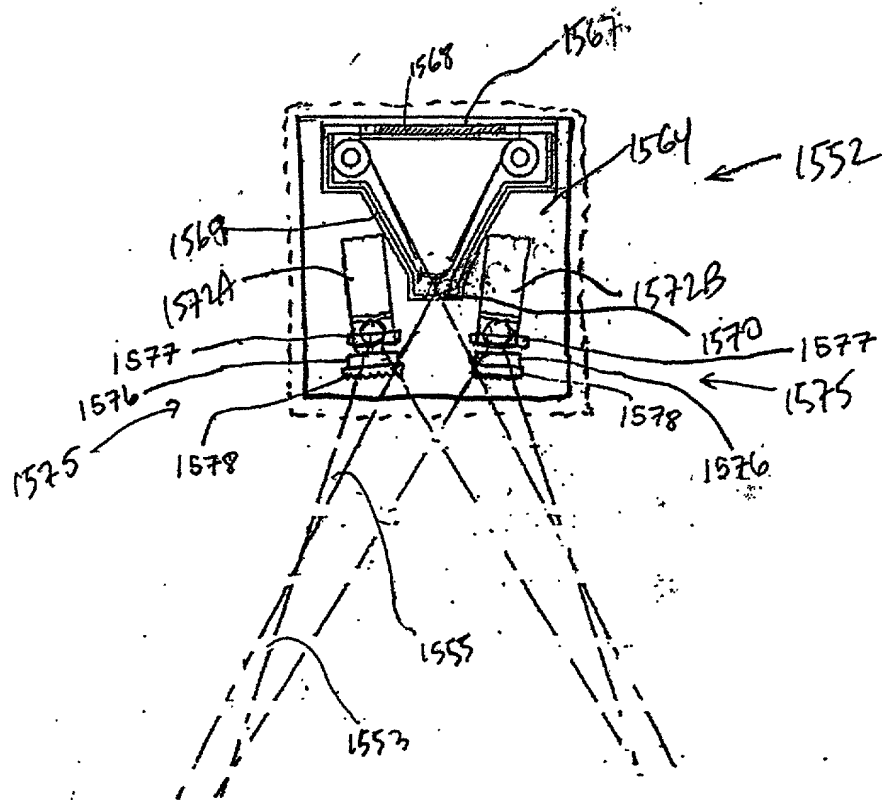


FIG. 42C

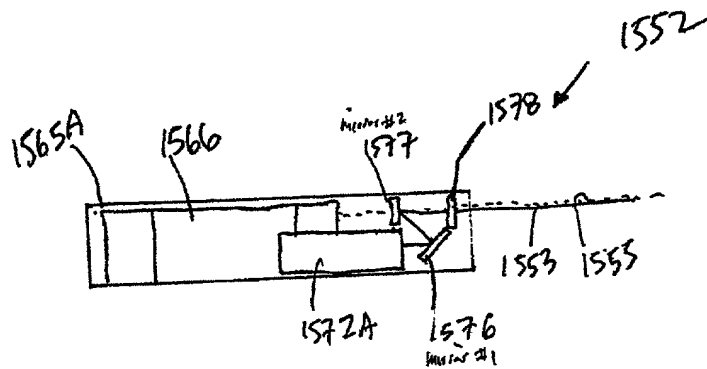
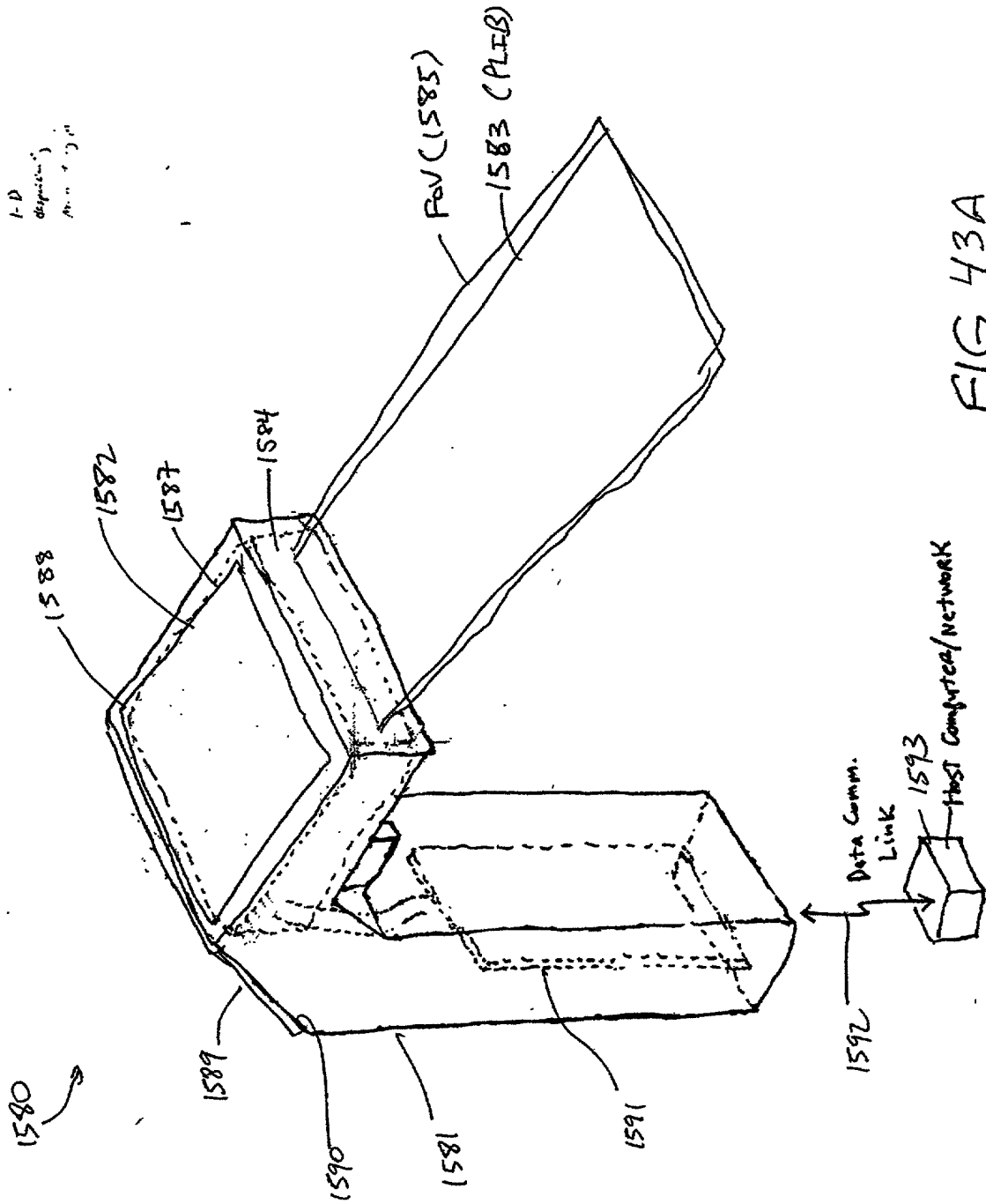


FIG. 42D

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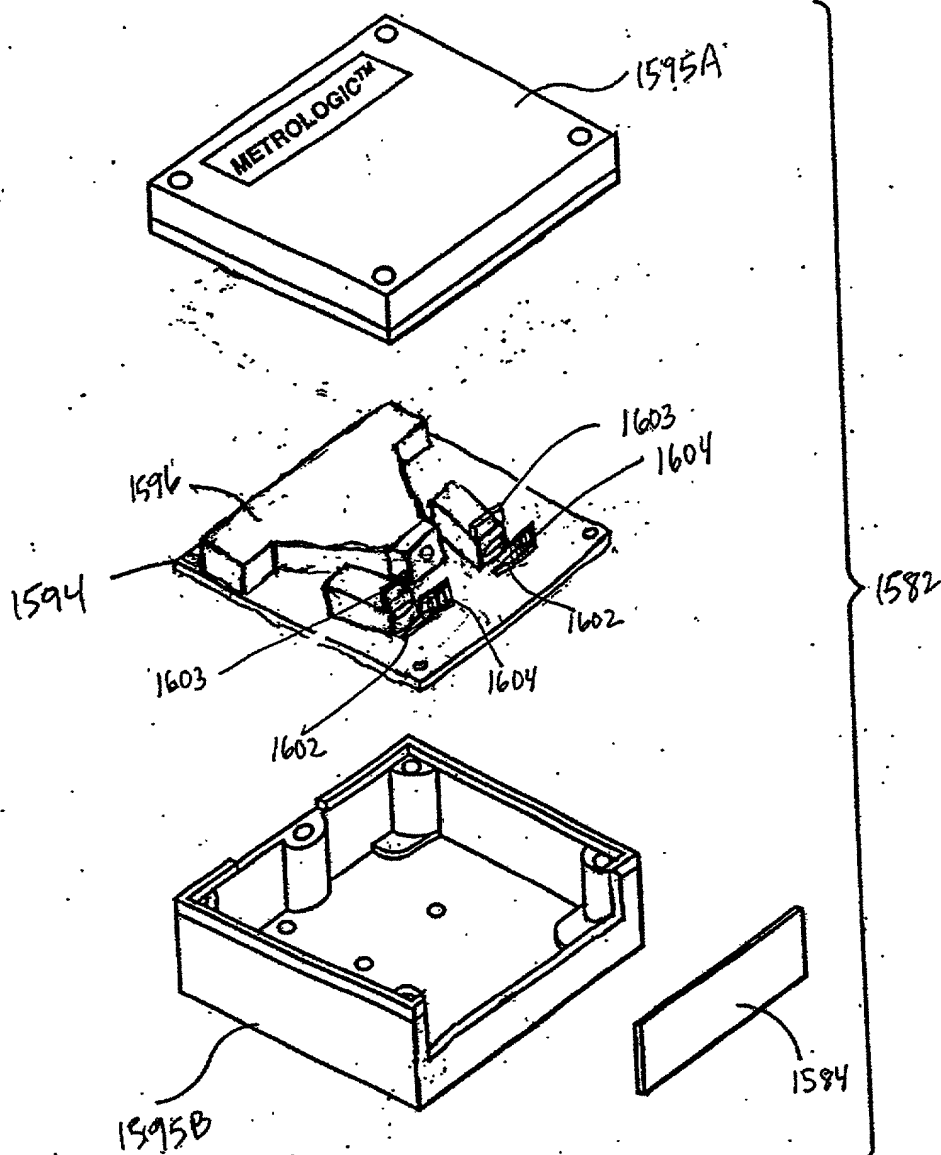


FIG. 43B



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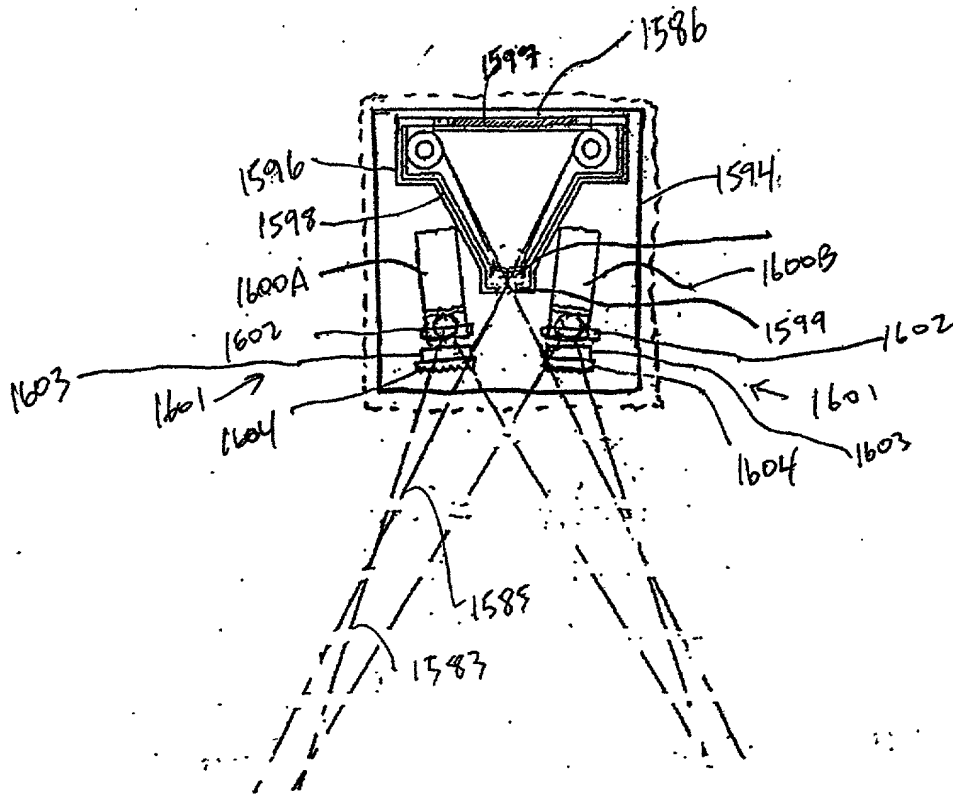


FIG. 43C

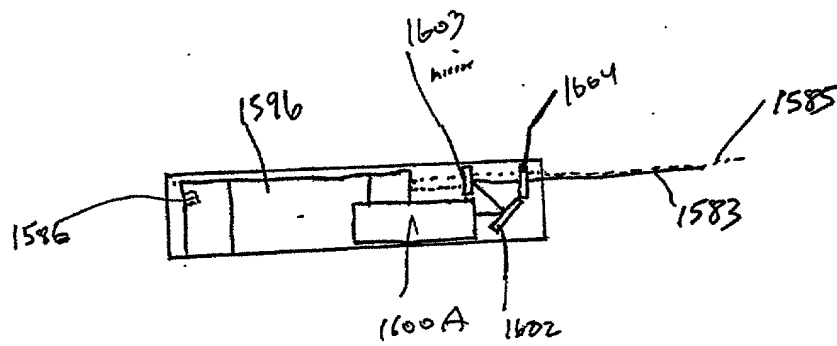


FIG. 43D

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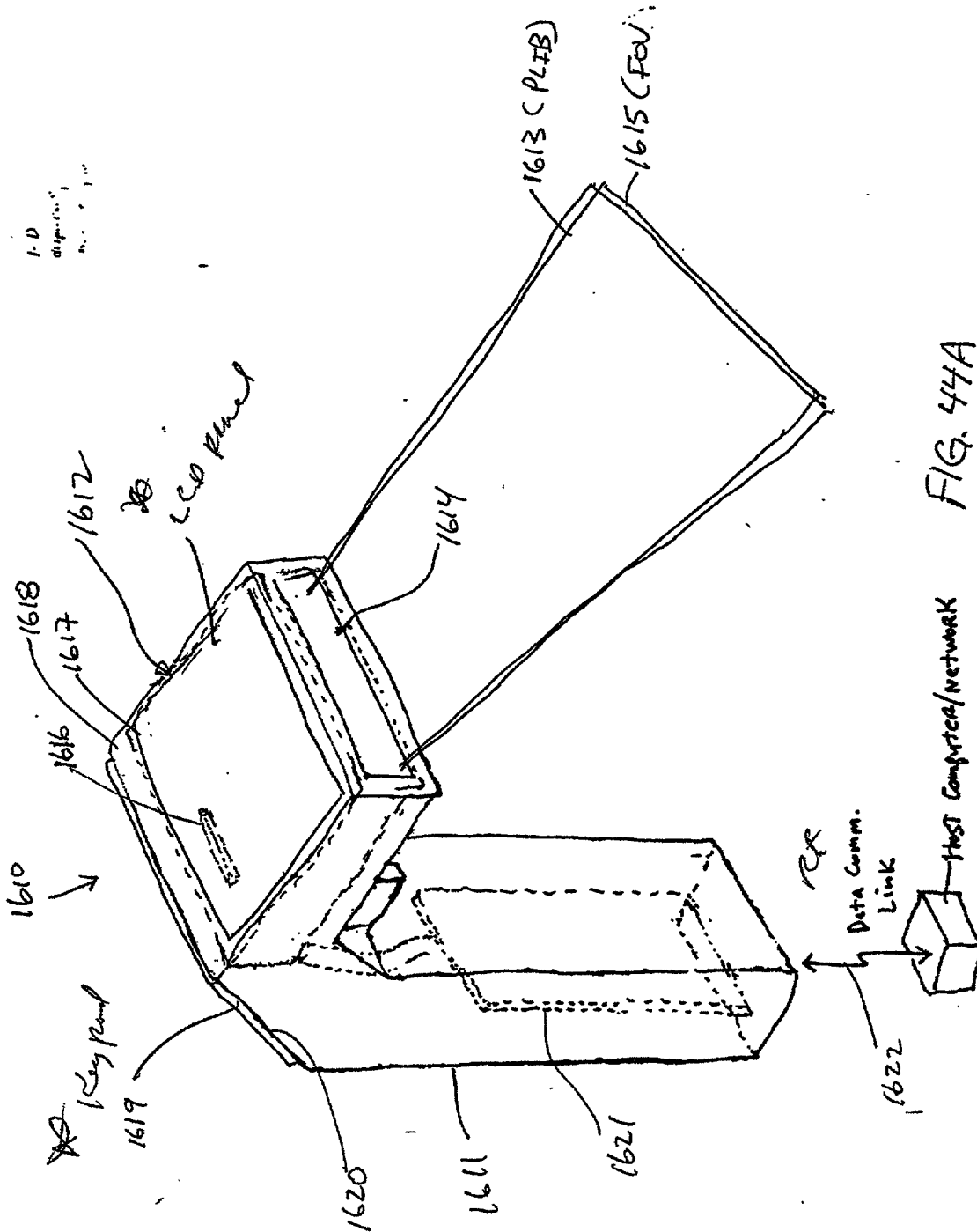


FIG. 44A

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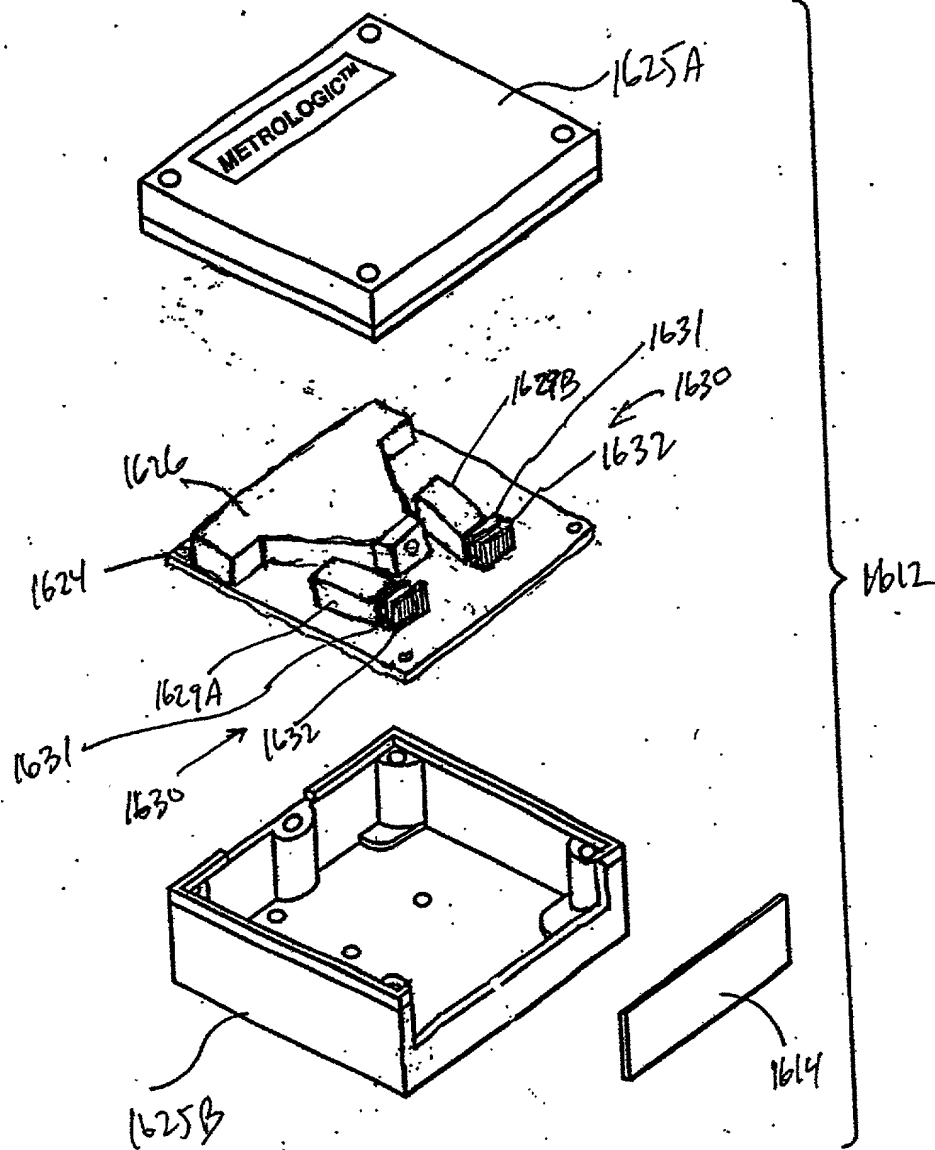


FIG. 44B

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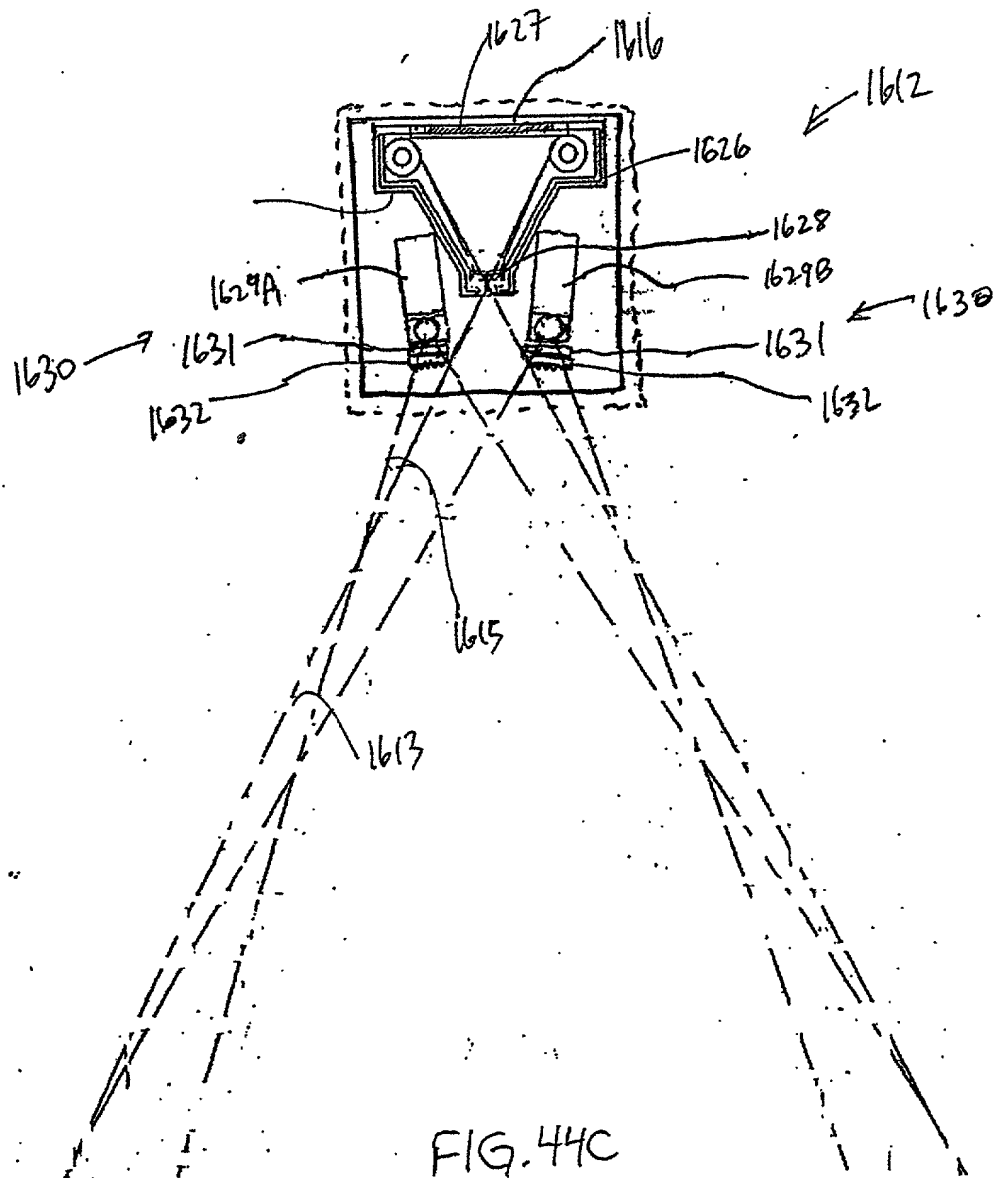


FIG. 44C

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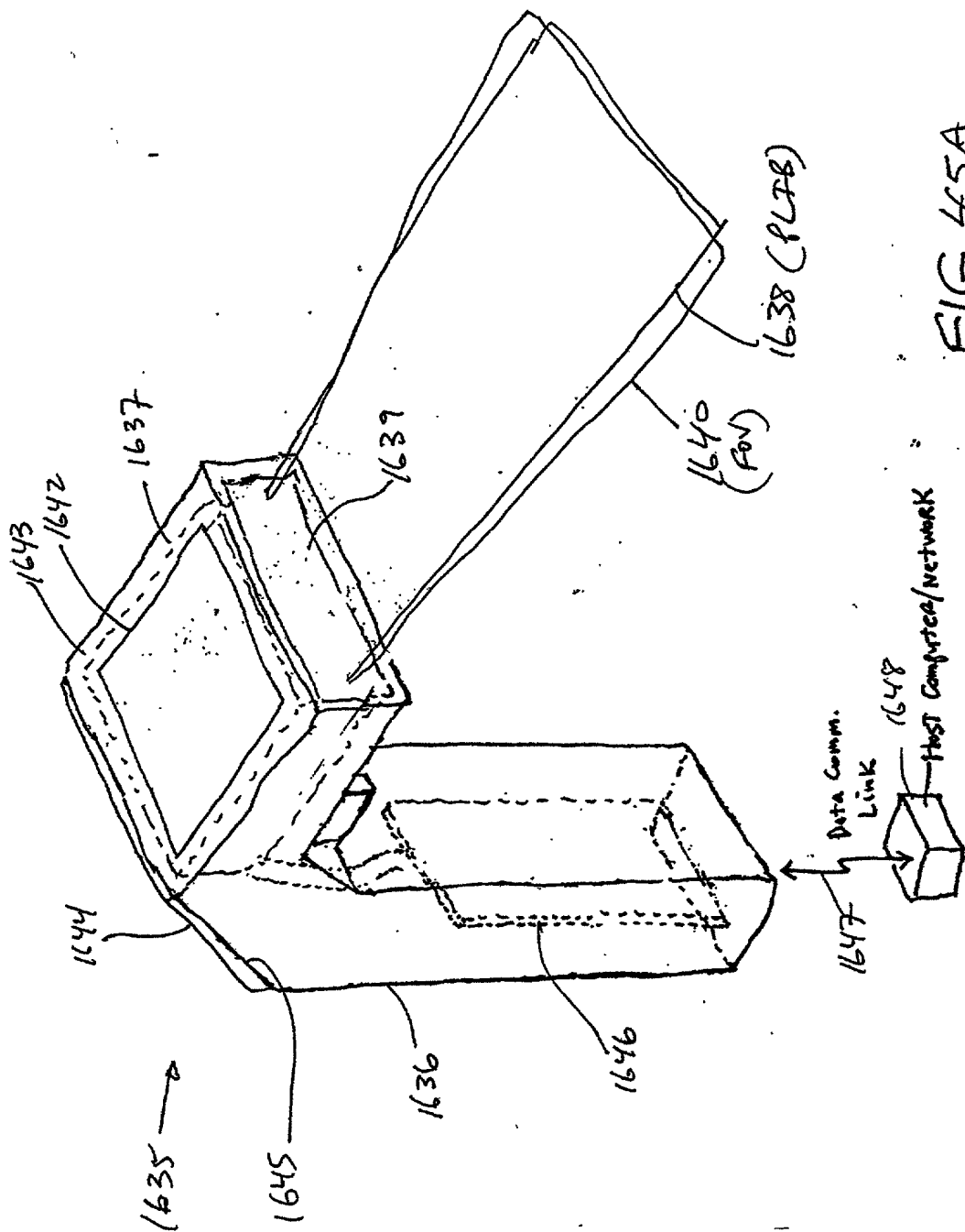


FIG. 45A

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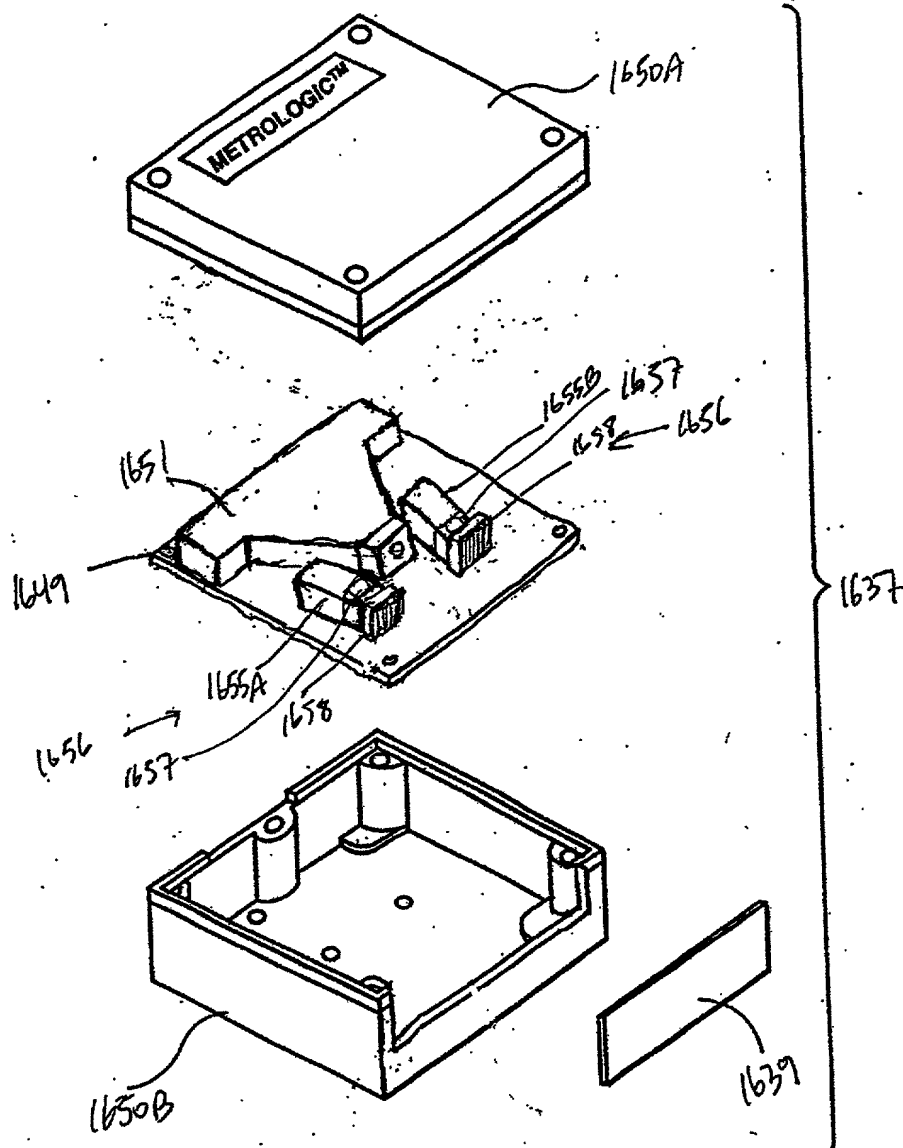


FIG. 45B

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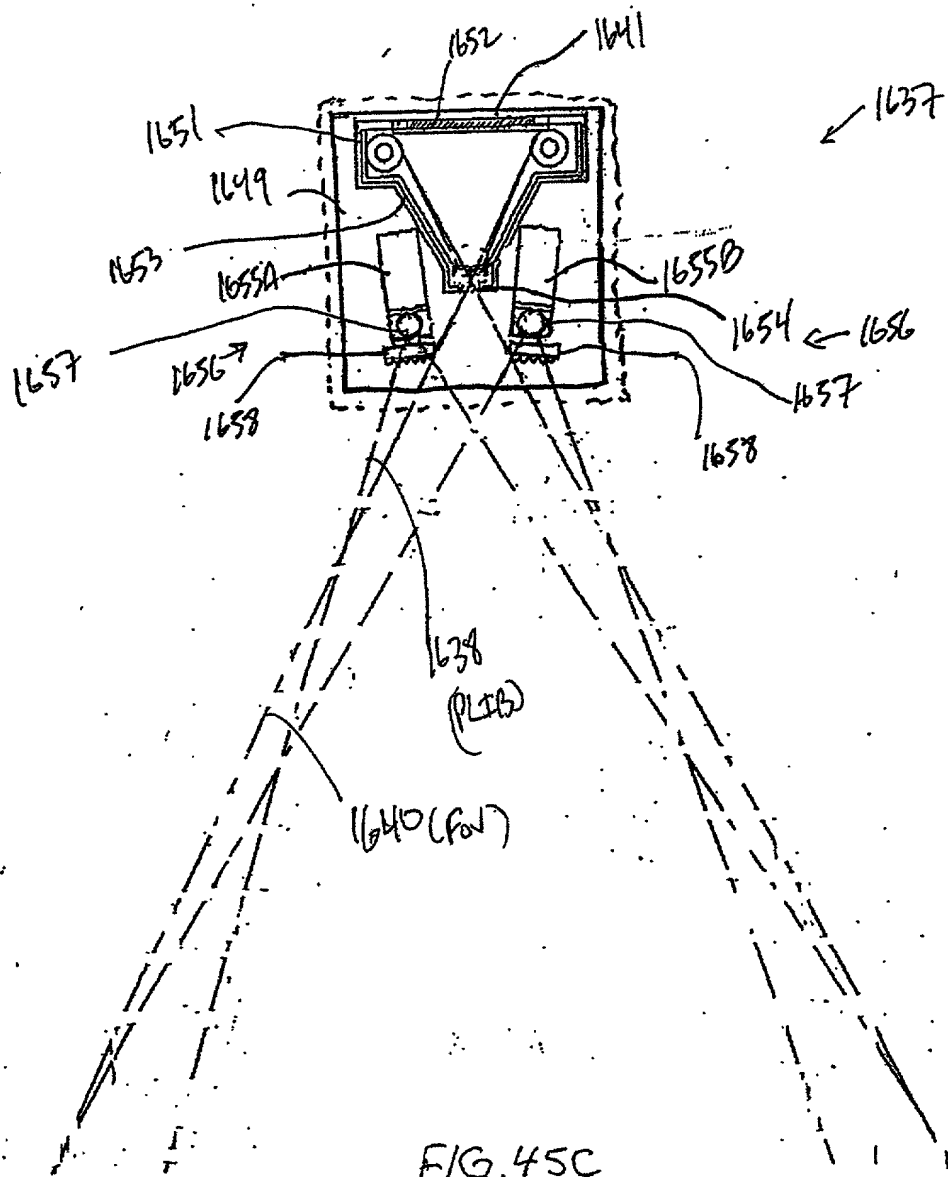


FIG. 45C

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1-D  
display  
...

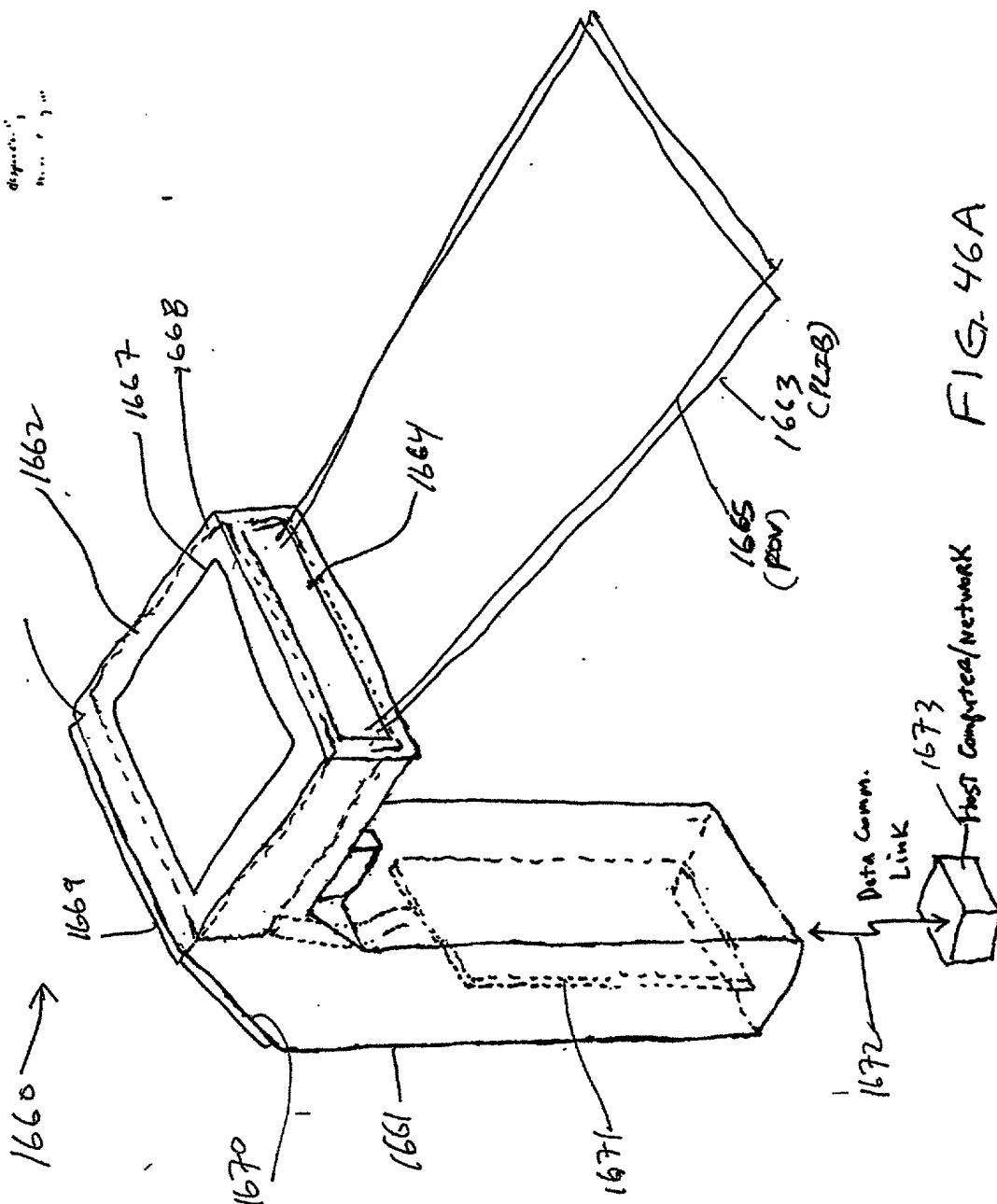


FIG. 46A



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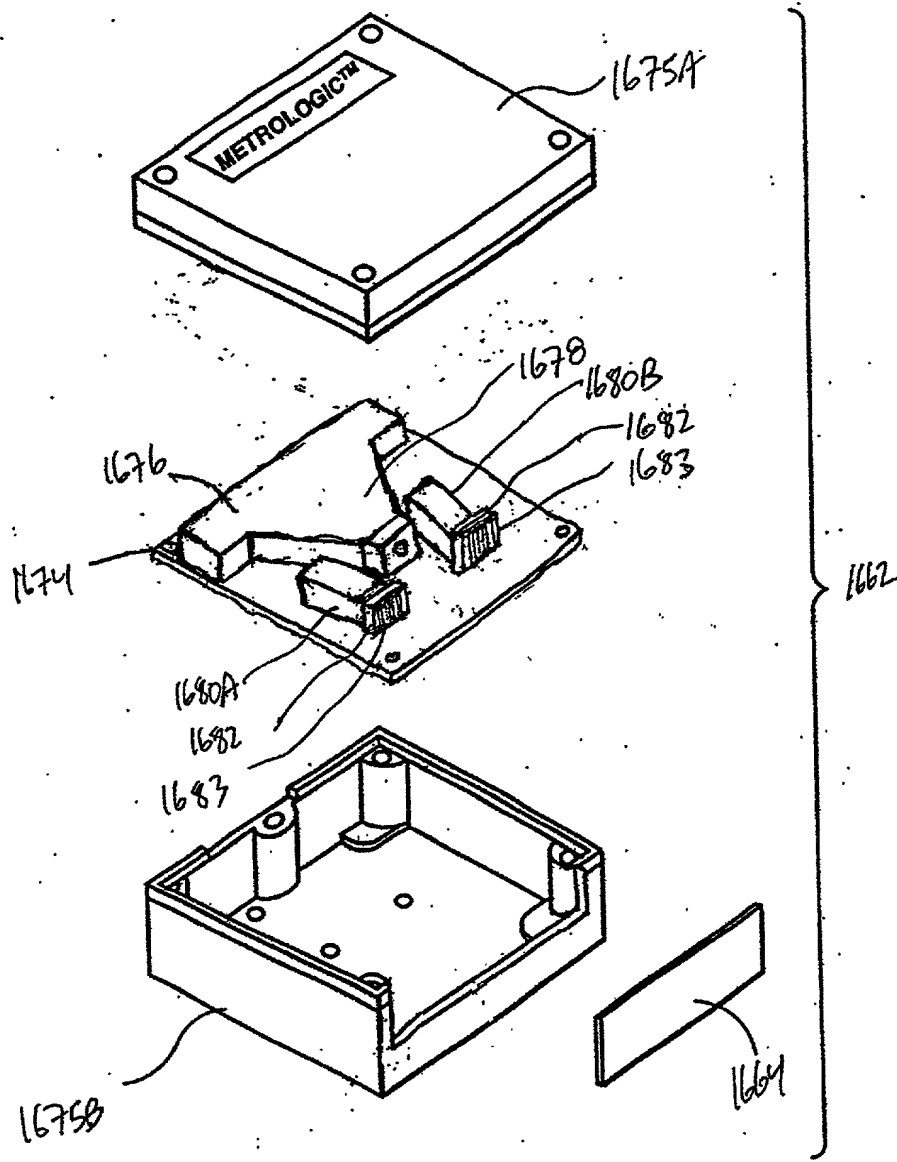


FIG. 46B

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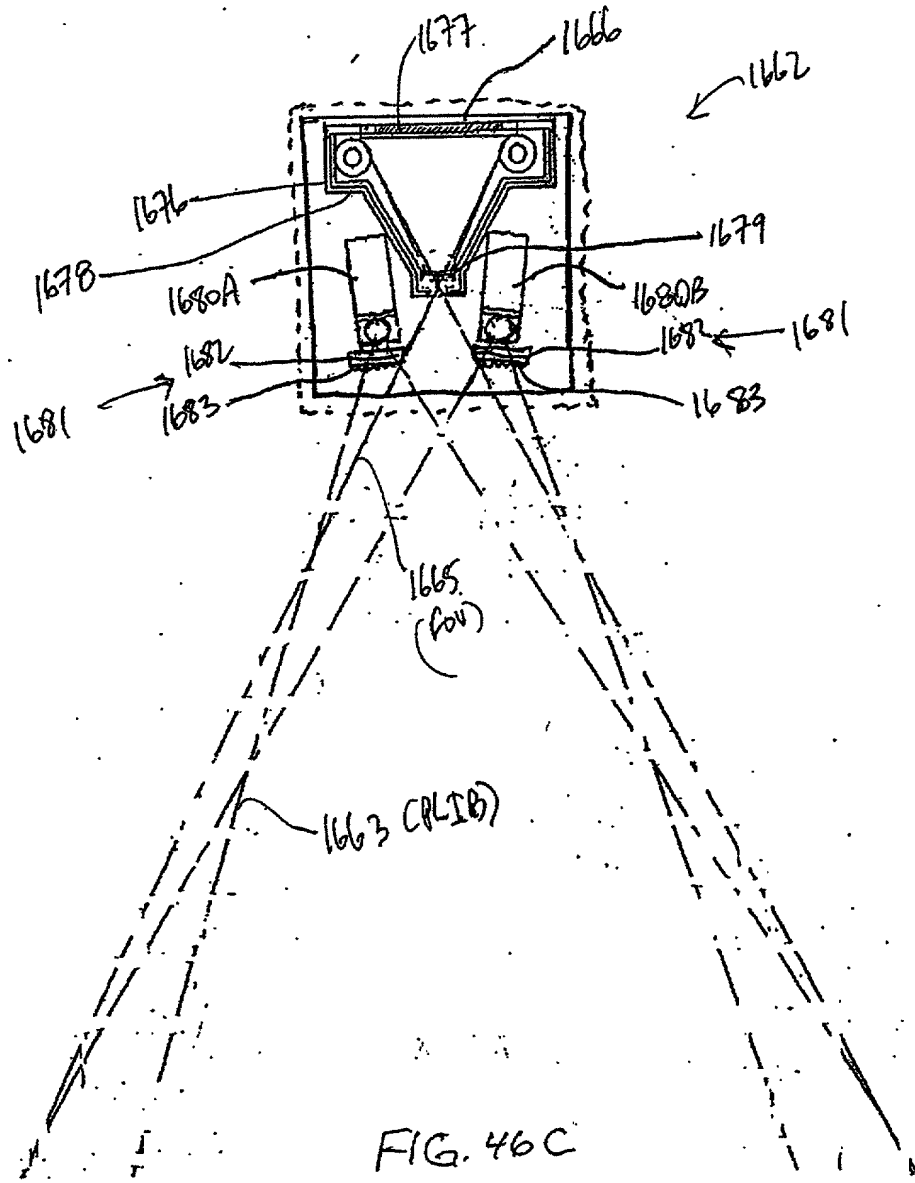
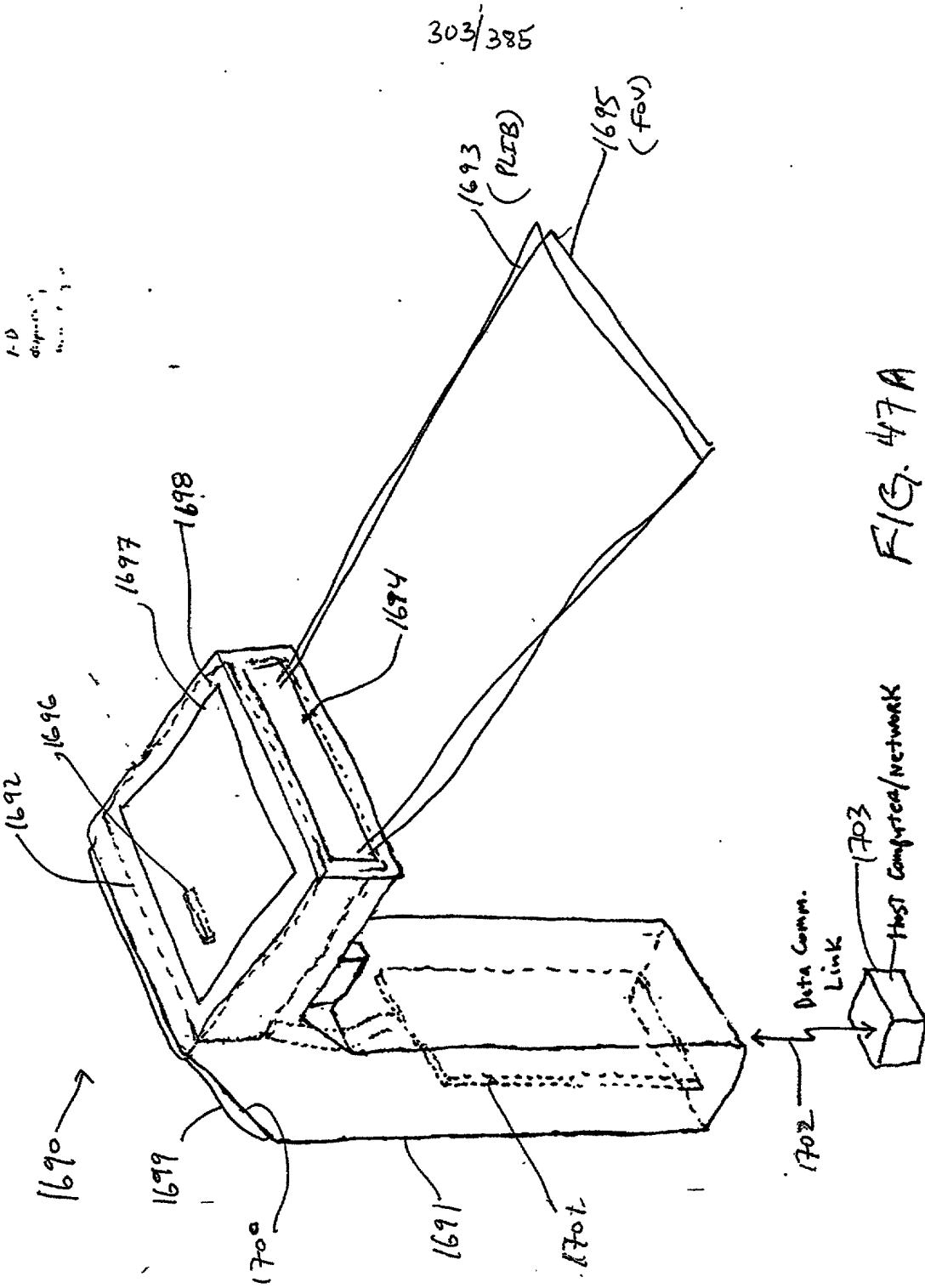


FIG. 47A



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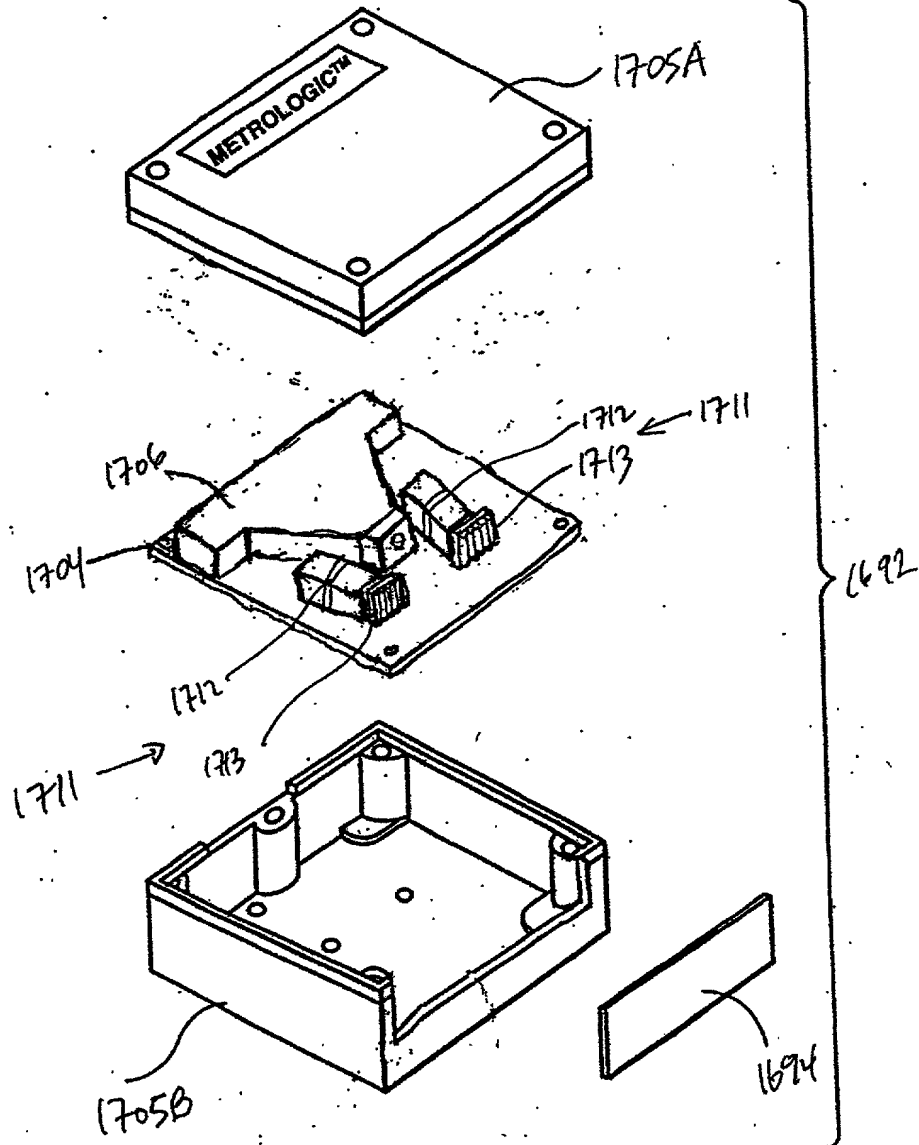
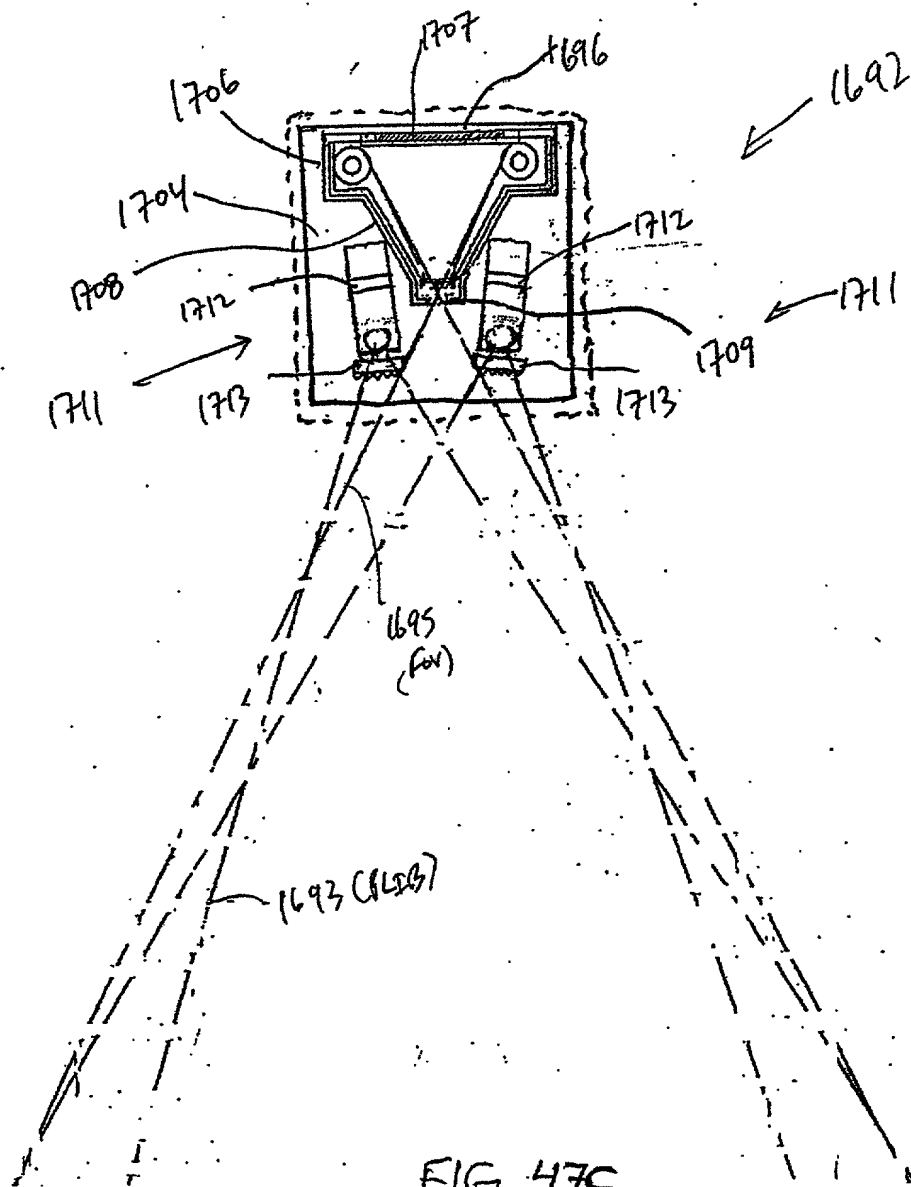


FIG. 47B

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1.0  
display  
m. 1.1m

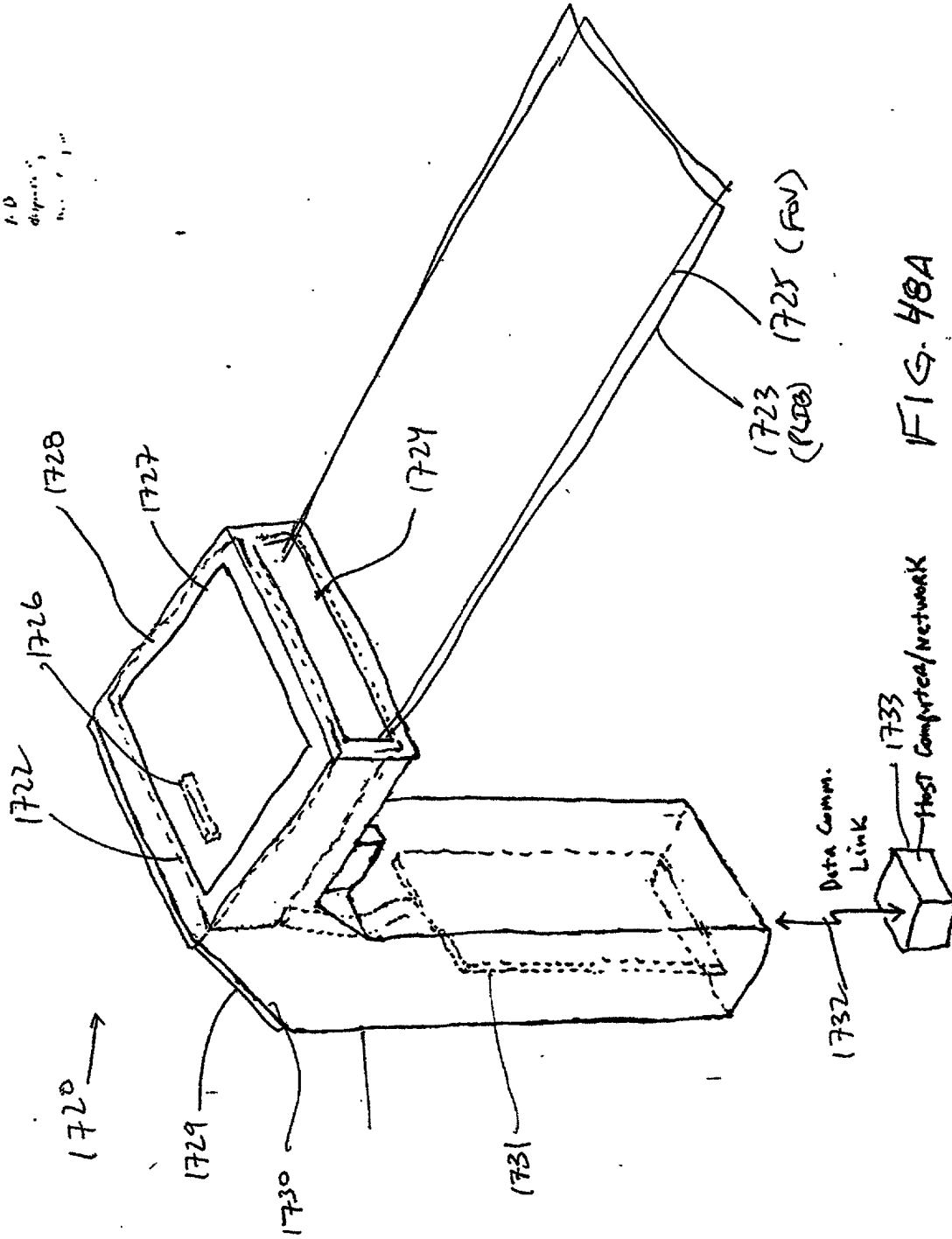


FIG. 48A

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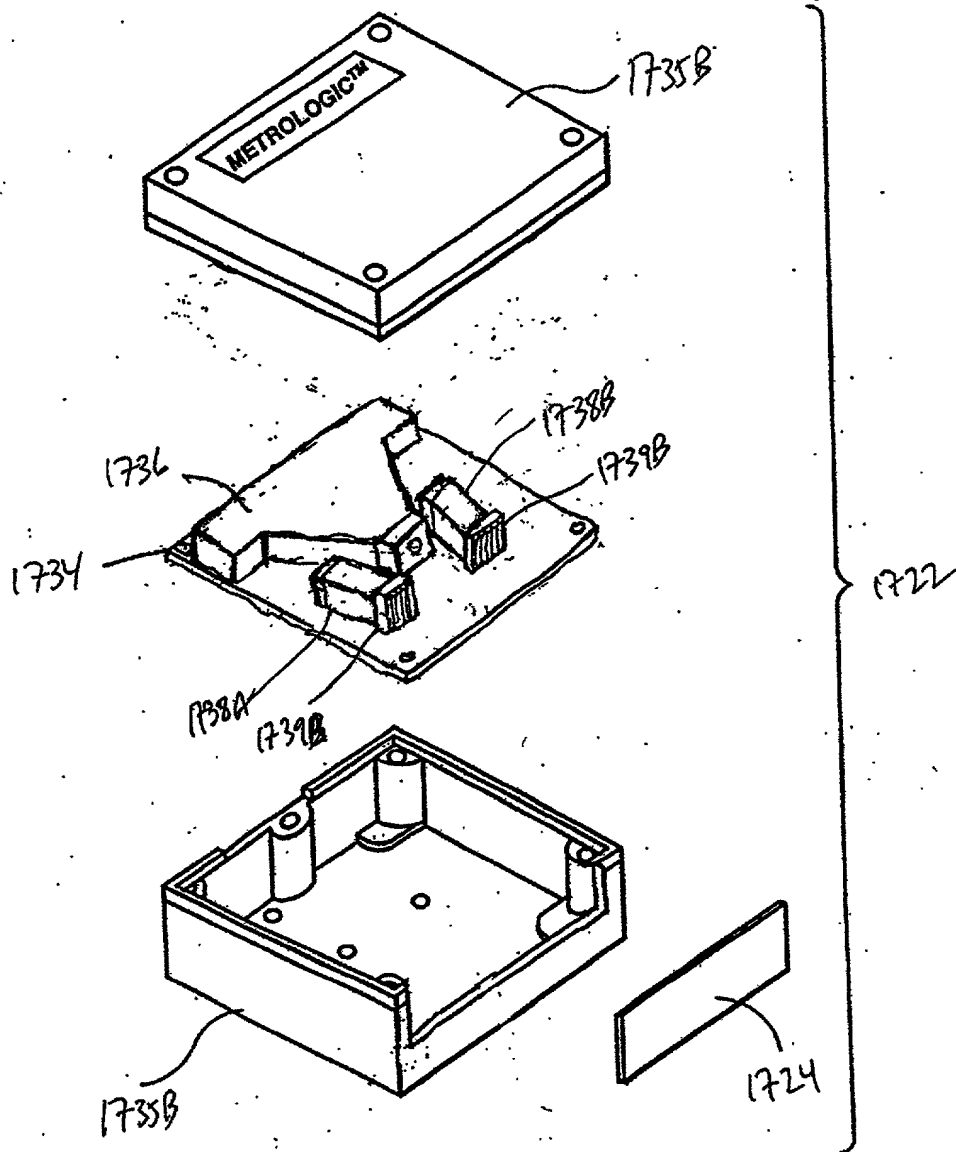


FIG. 48B

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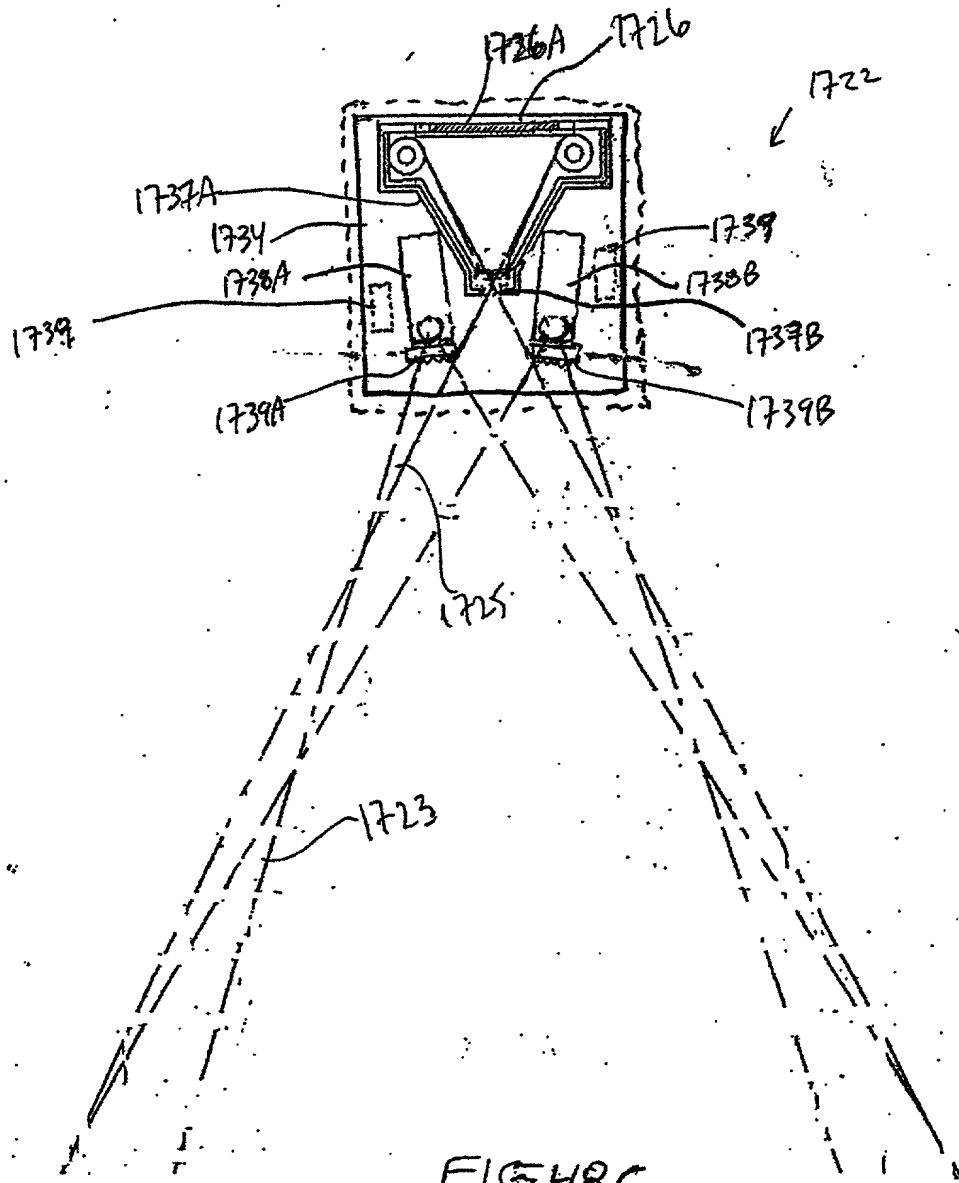


FIG. 48C



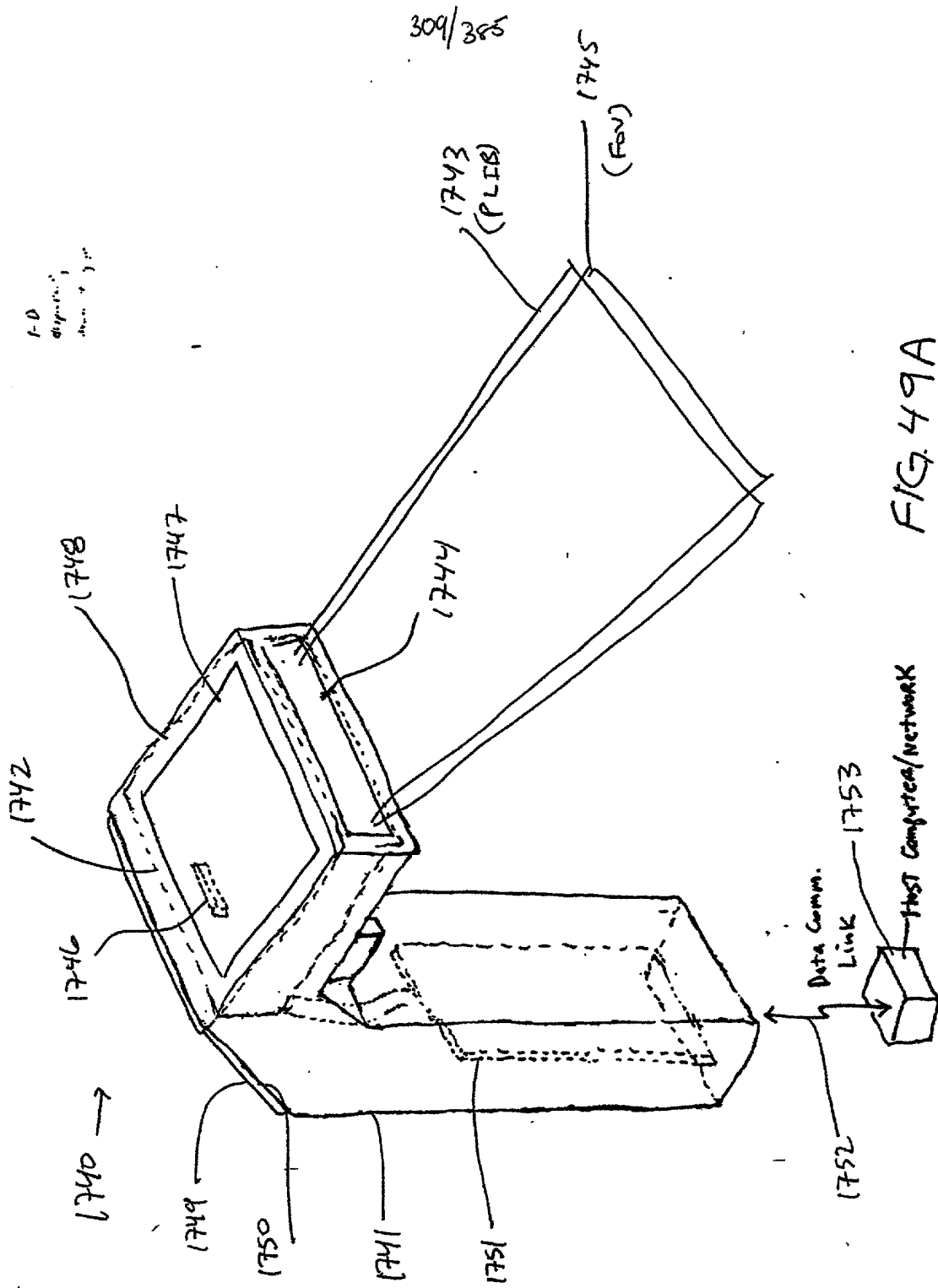


FIG. 49A

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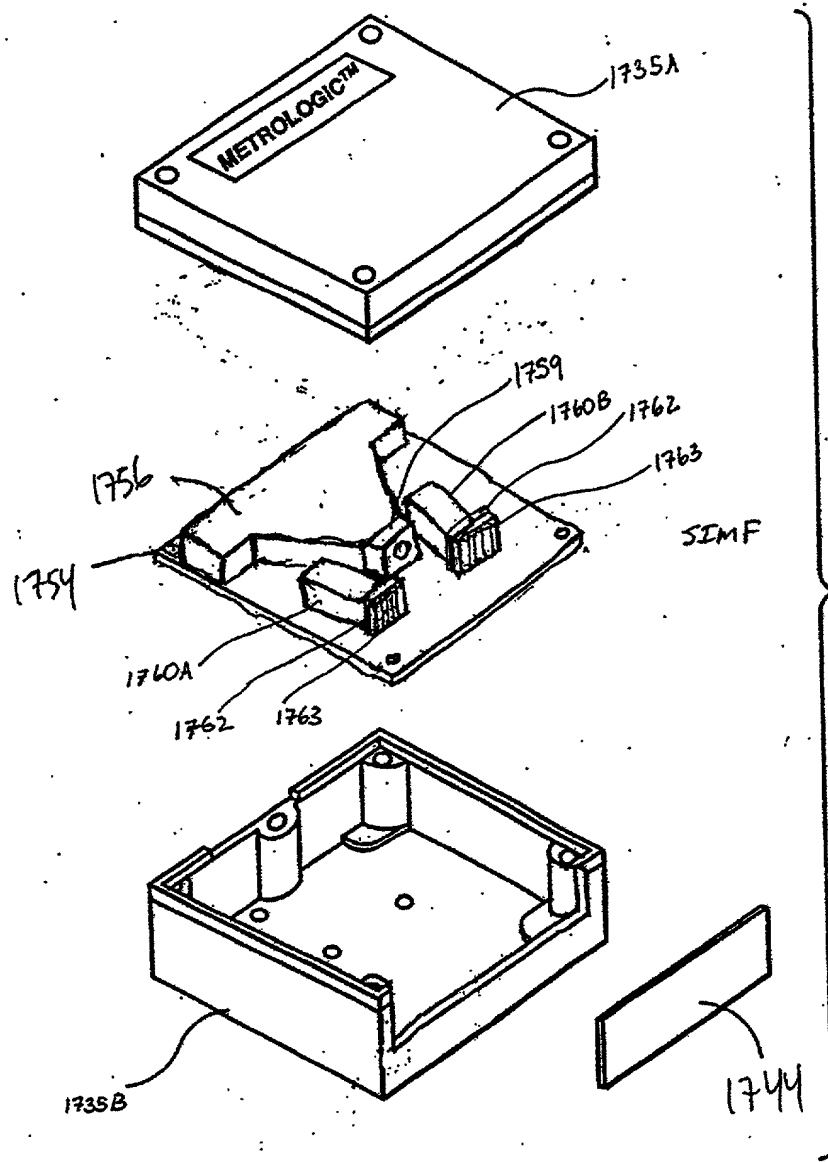


FIG. 49B

(311/385)

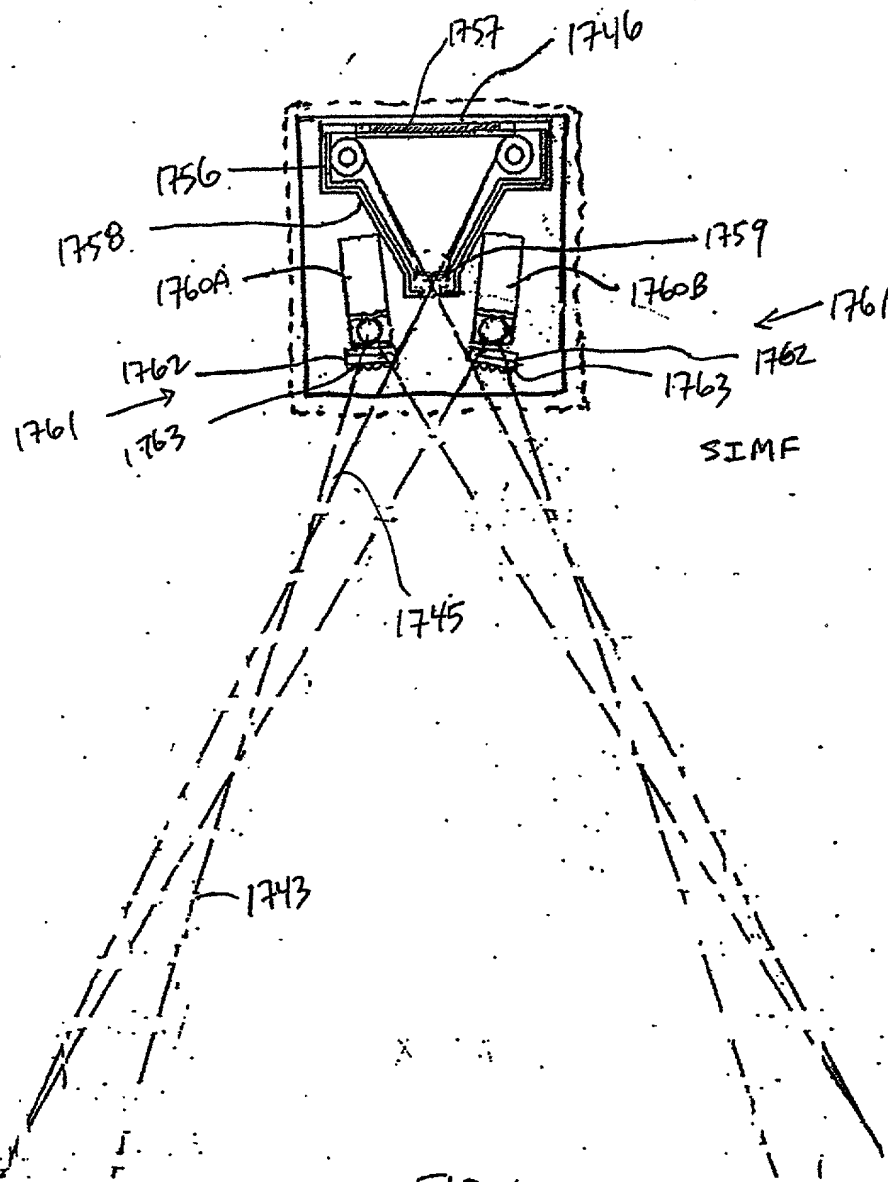


FIG. 49C



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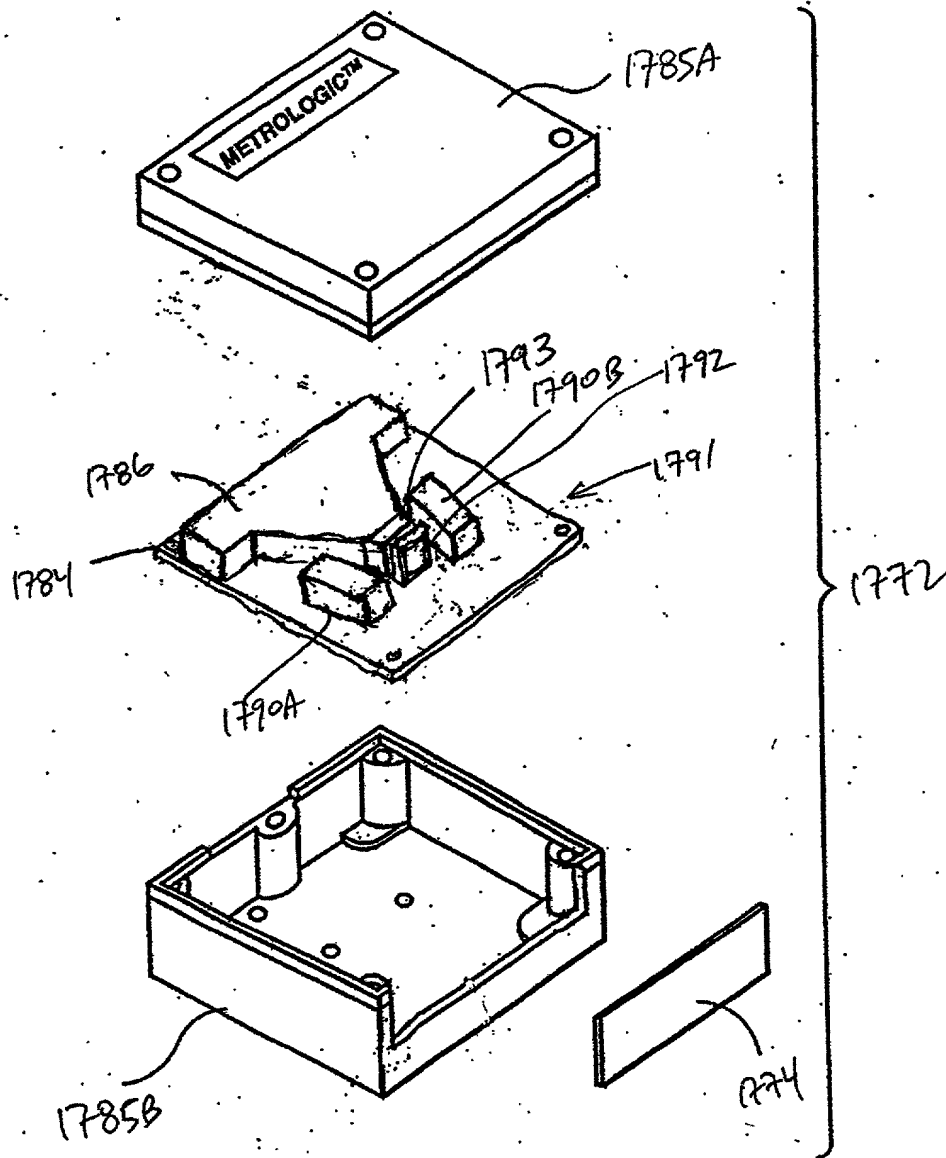


FIG. 50B

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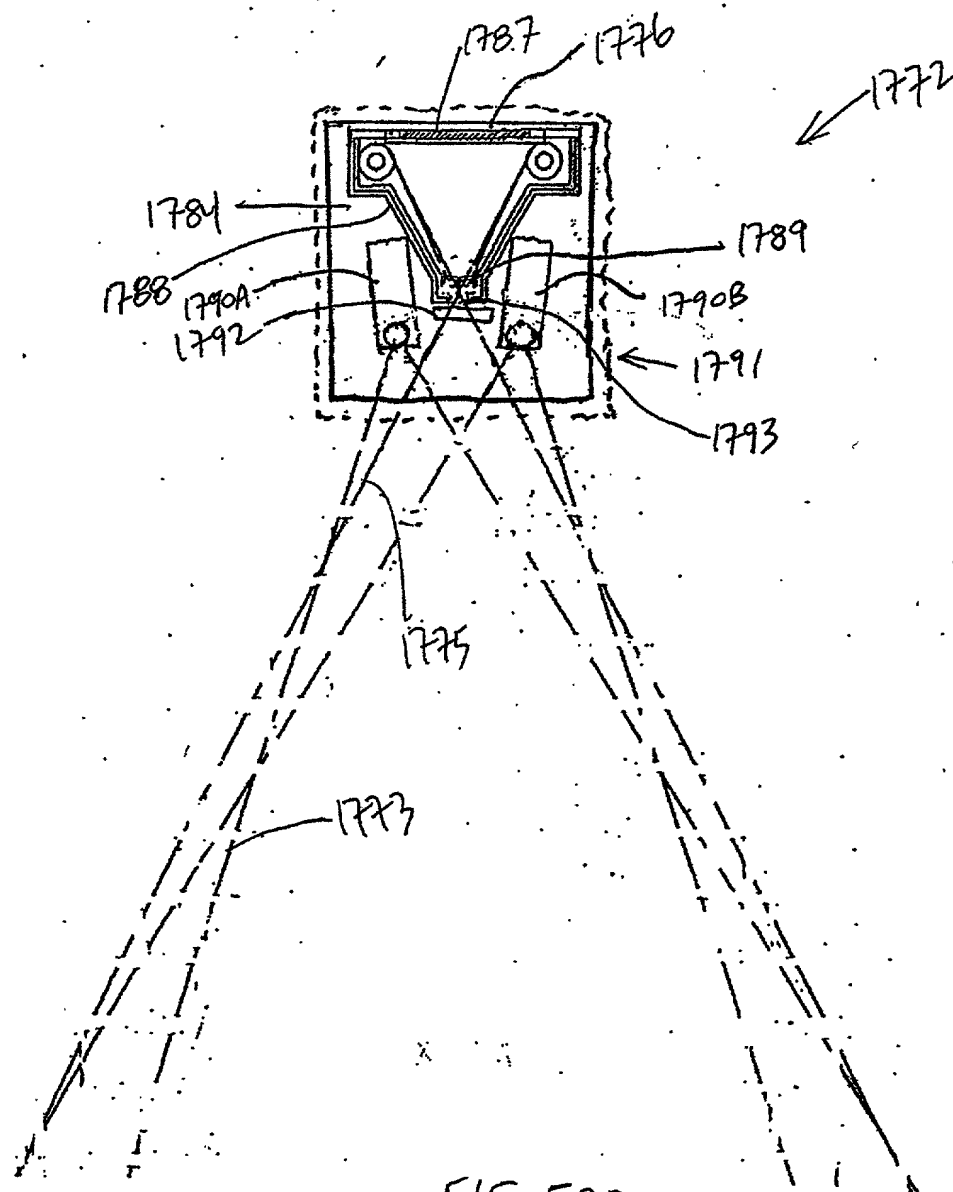


FIG. 50C

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1-D  
display  
unit, 315

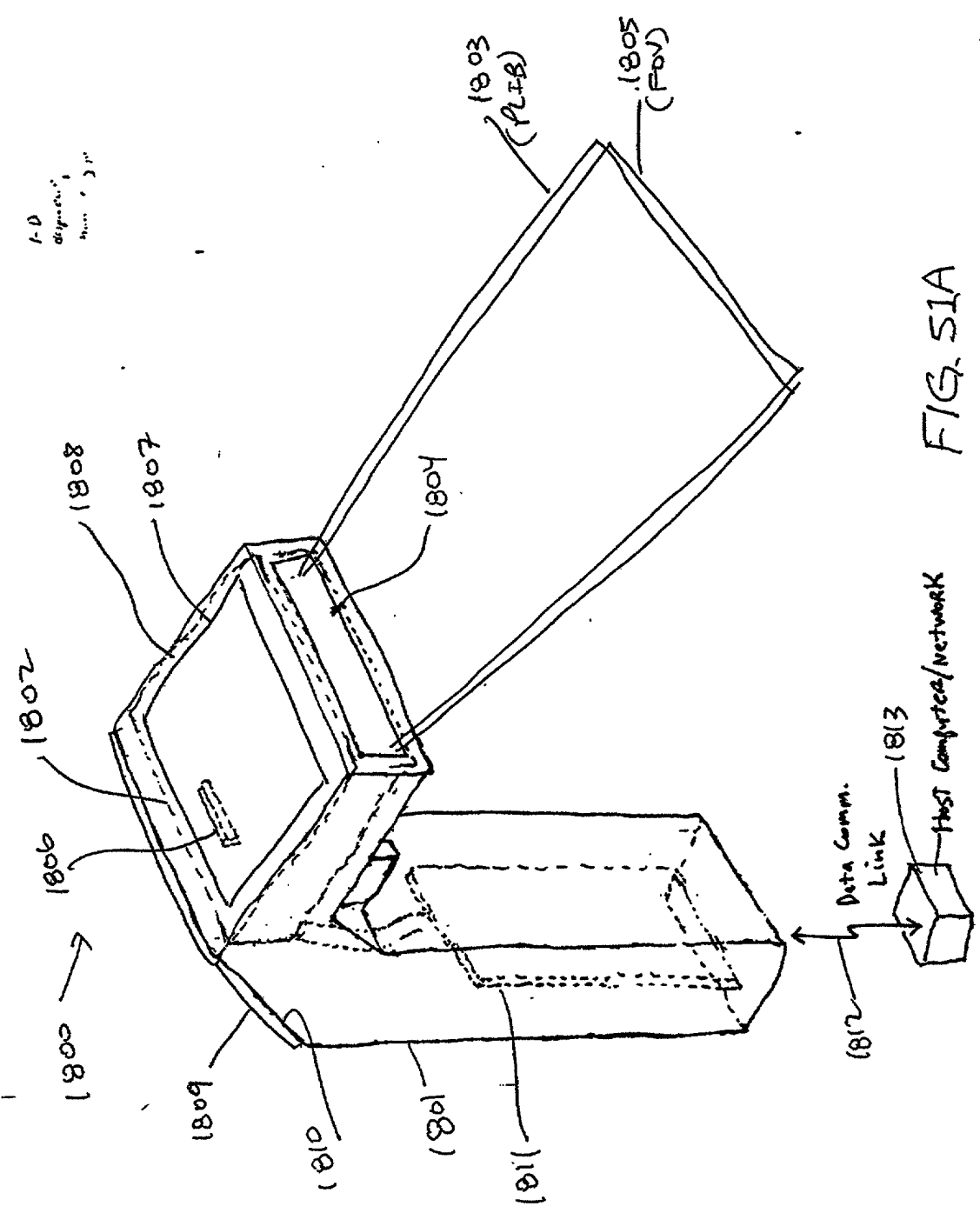


FIG. 51A

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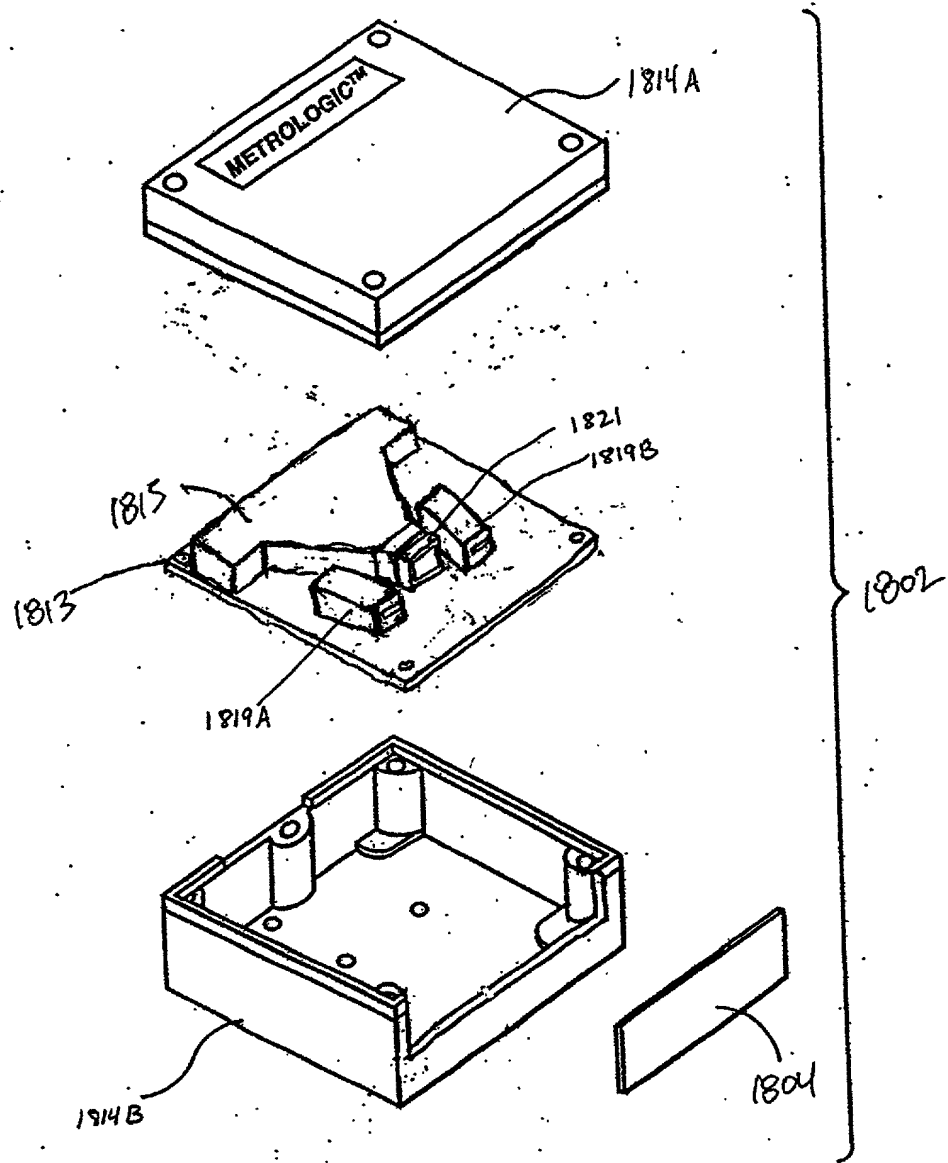


FIG. 51B



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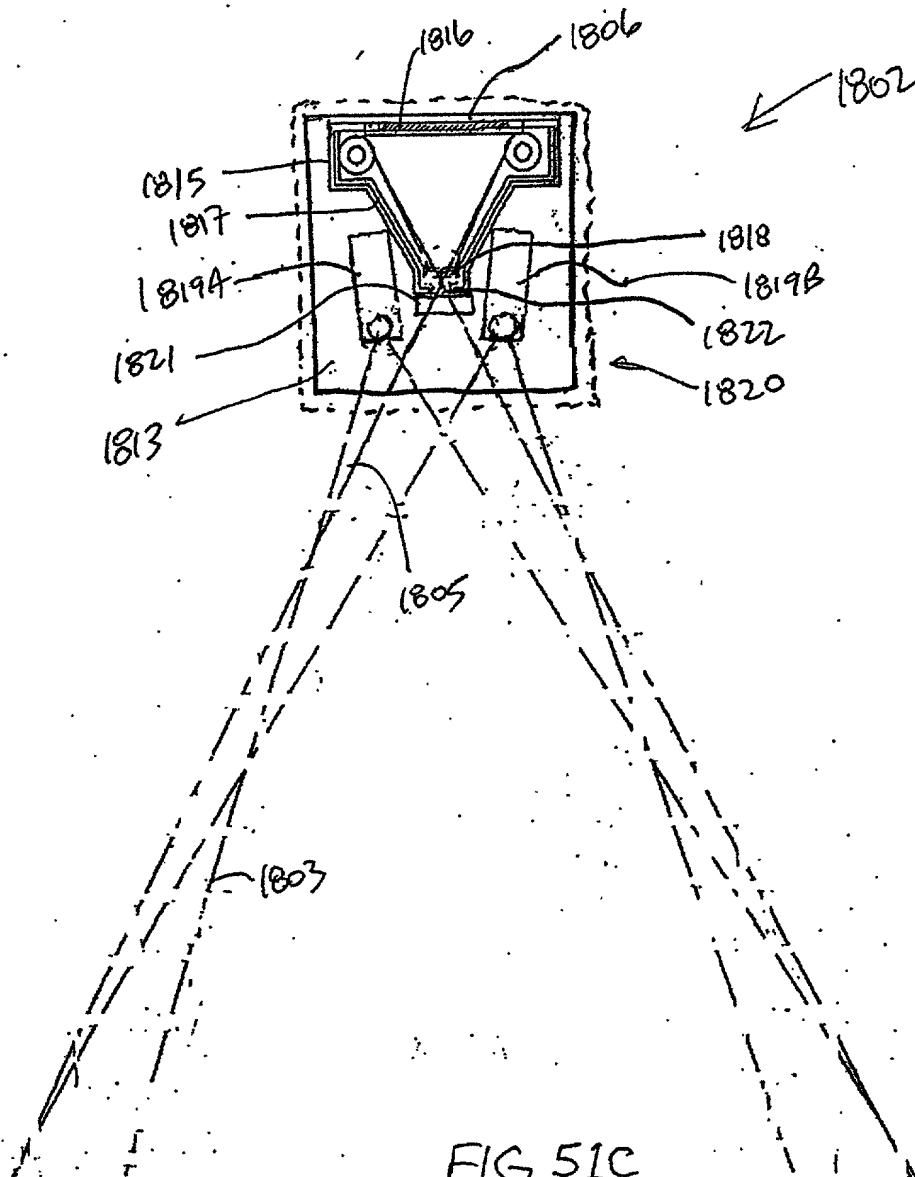


FIG. 51C

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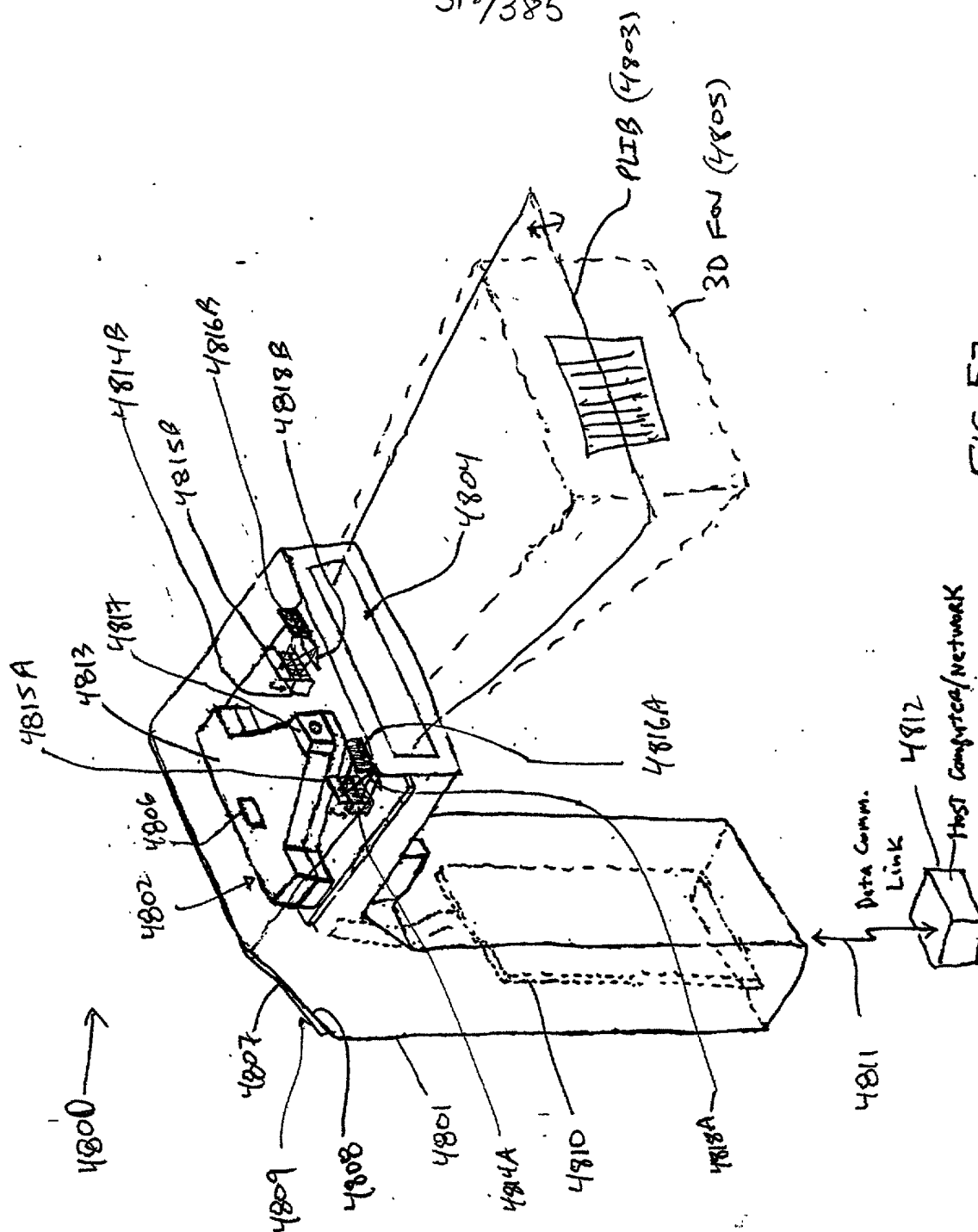
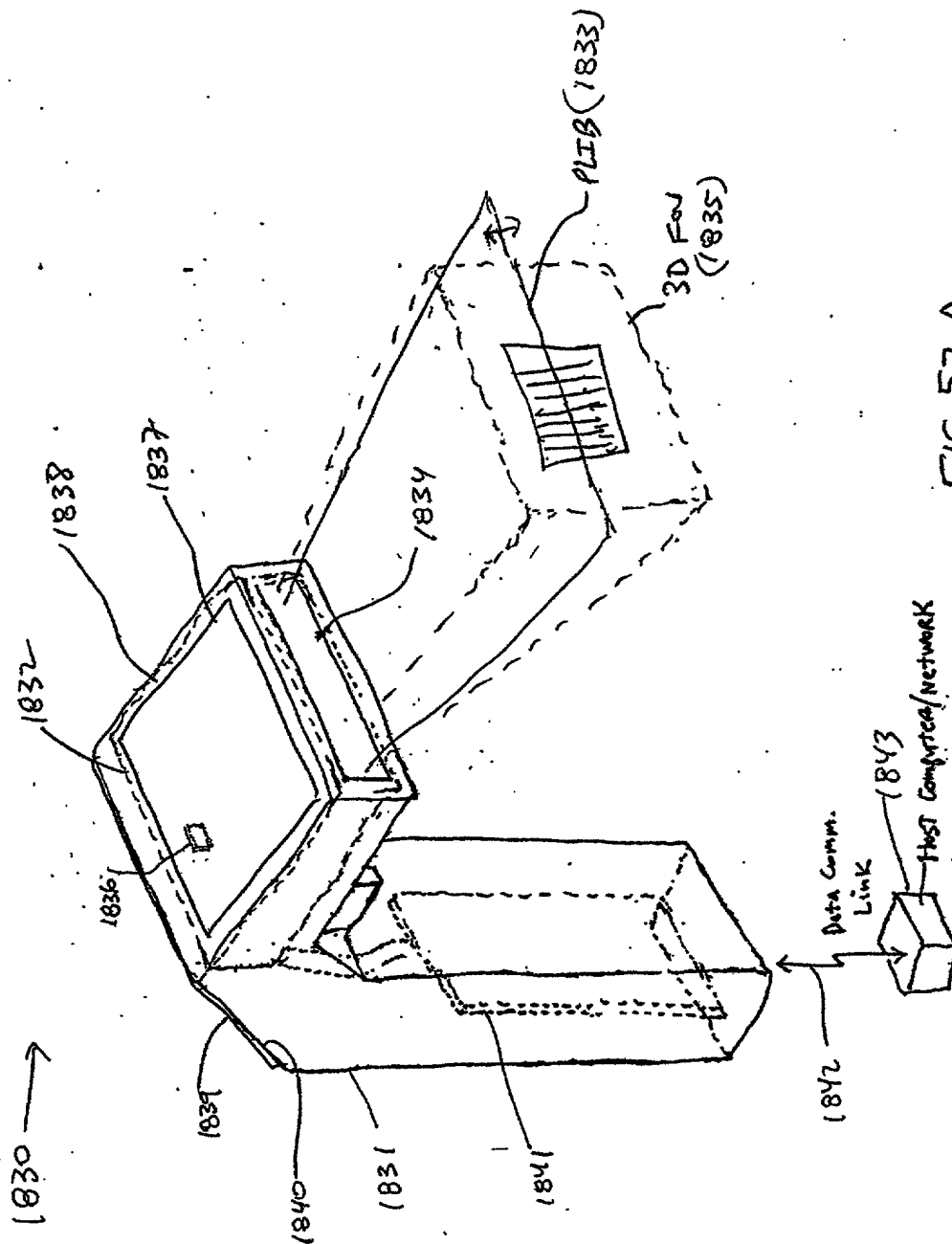


FIG. 52

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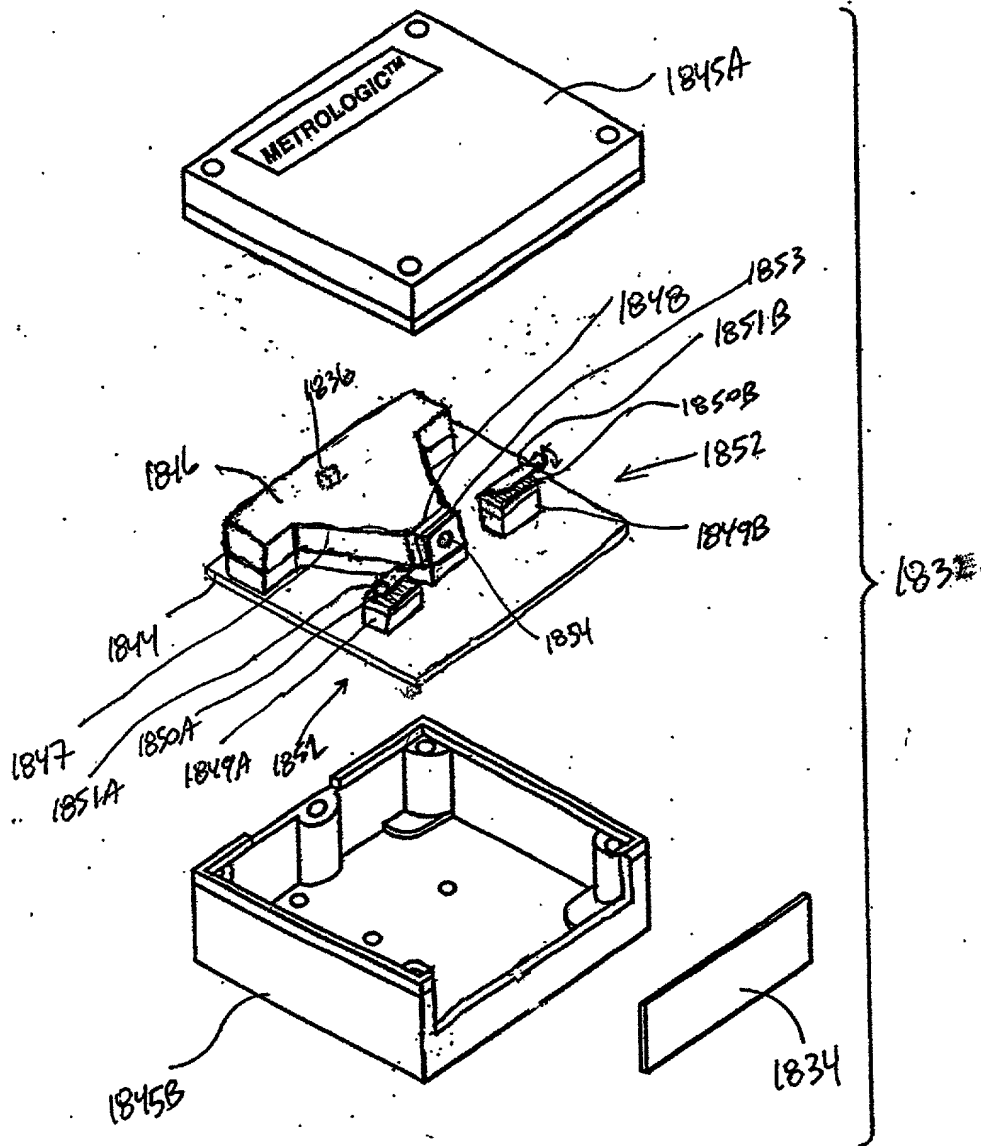


FIG. 52B

Fig. 113A-3B

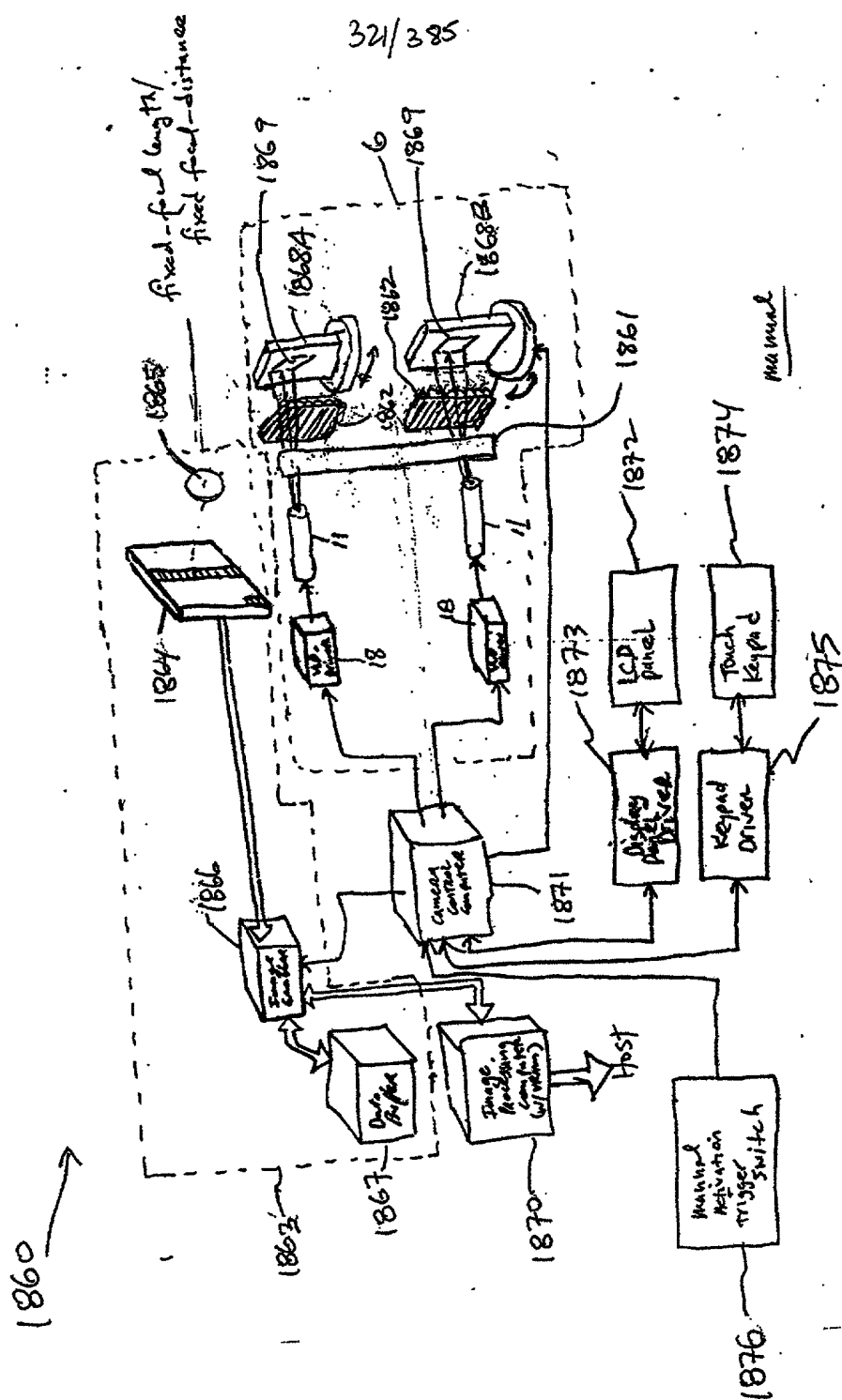
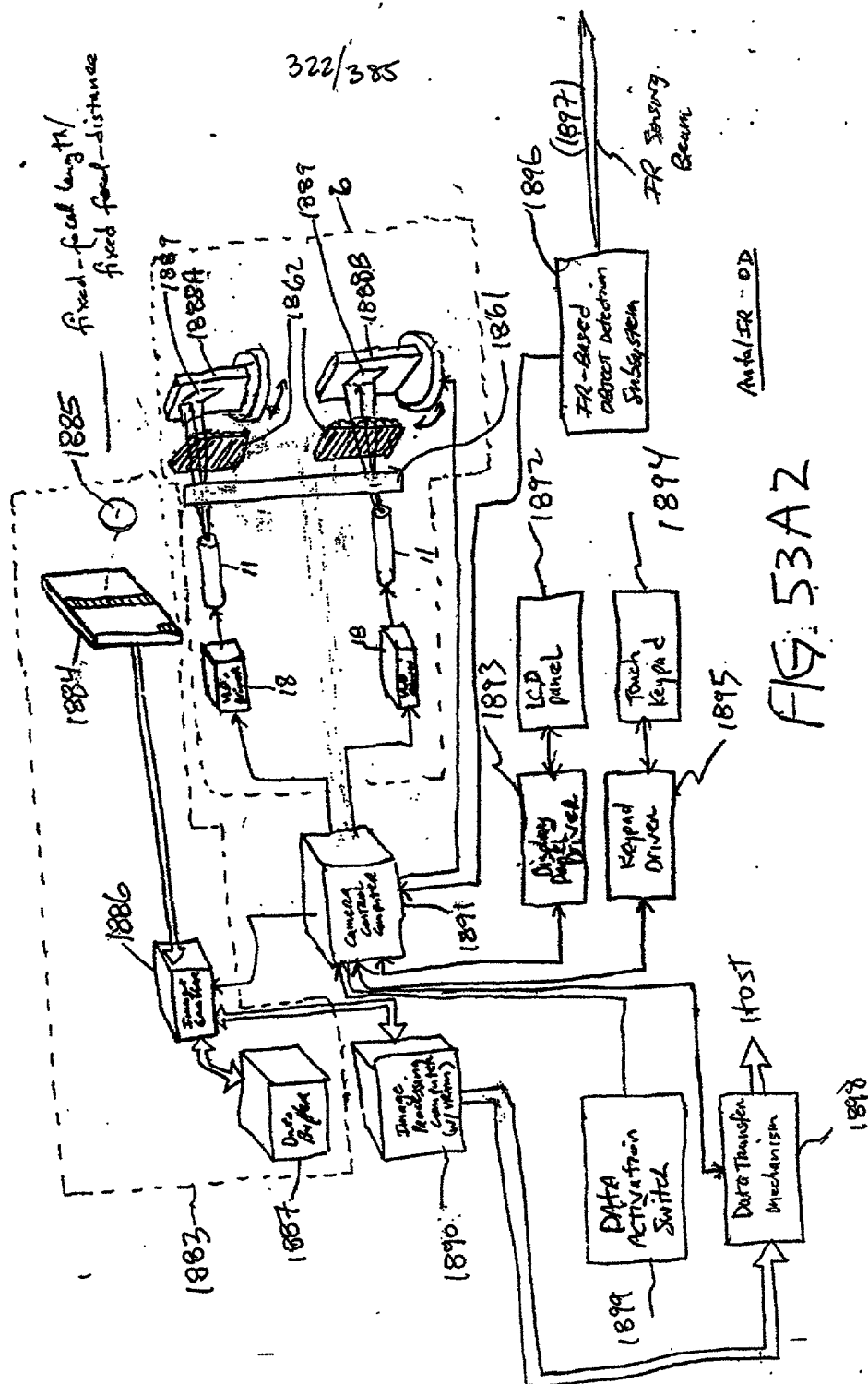


FIG 53A1

1880



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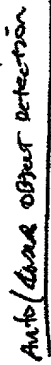
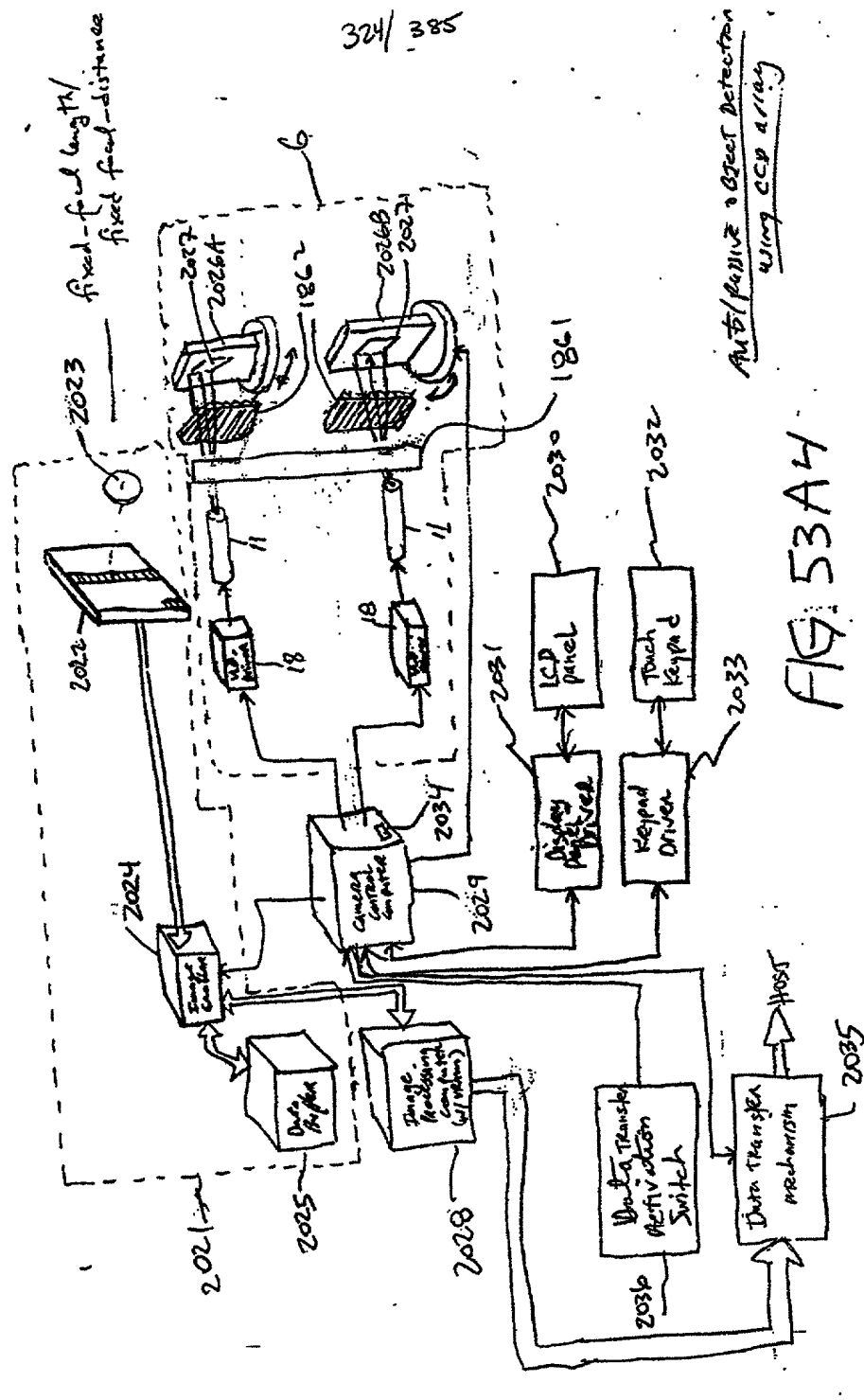


FIG. 53A3

$$324 \overline{) 385}$$




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Auto / Bcd only in object detection

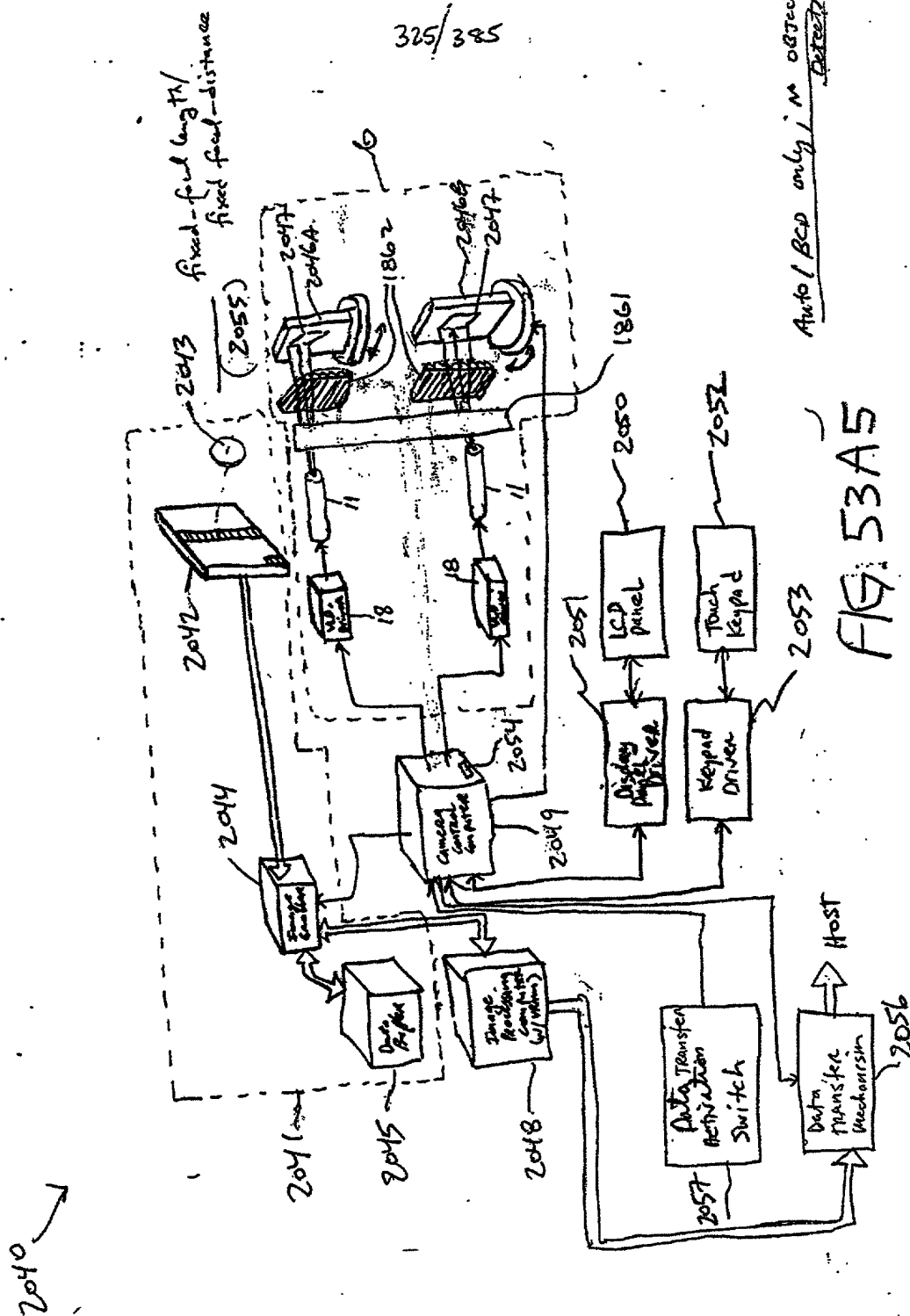


FIG. 53A5

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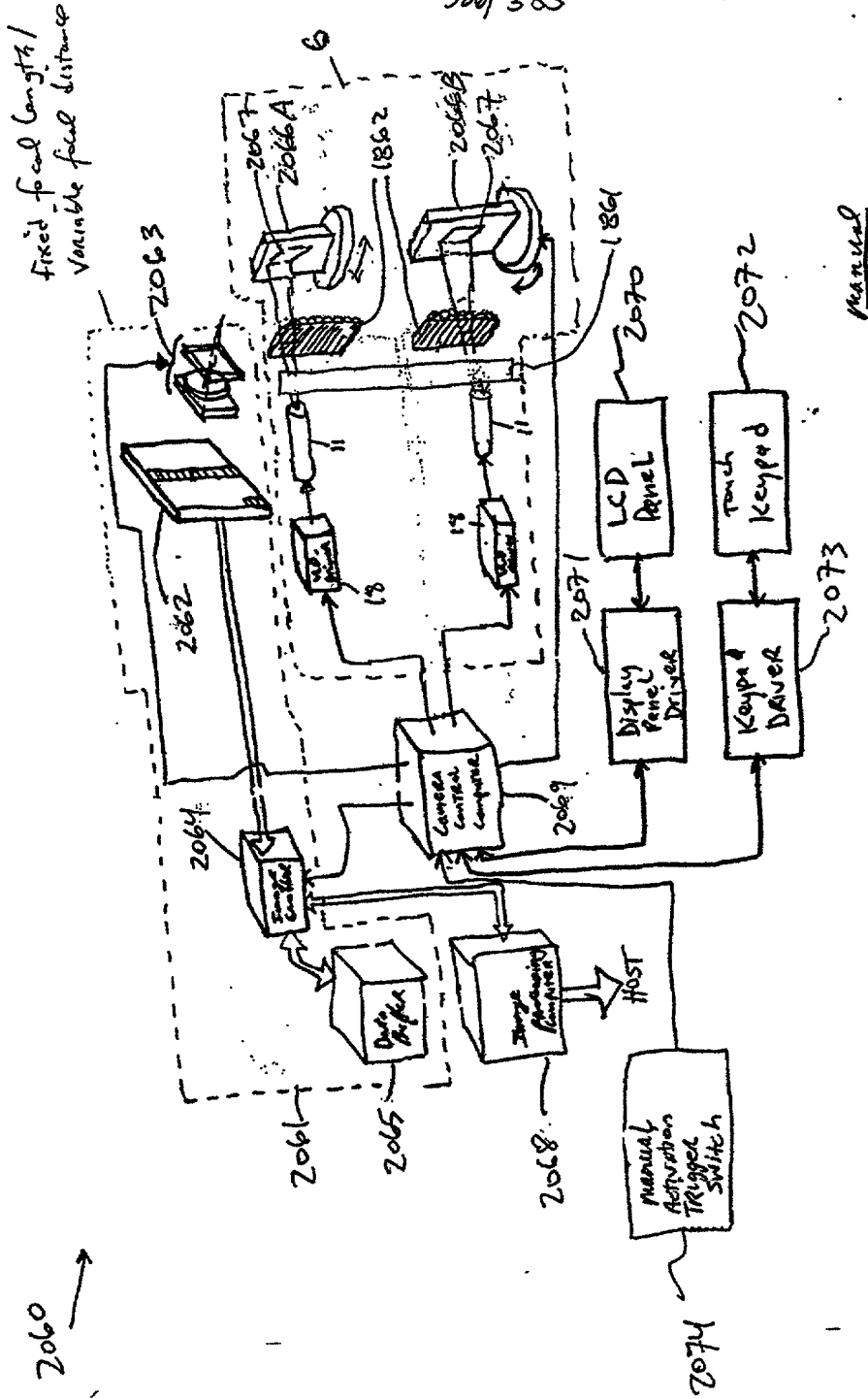
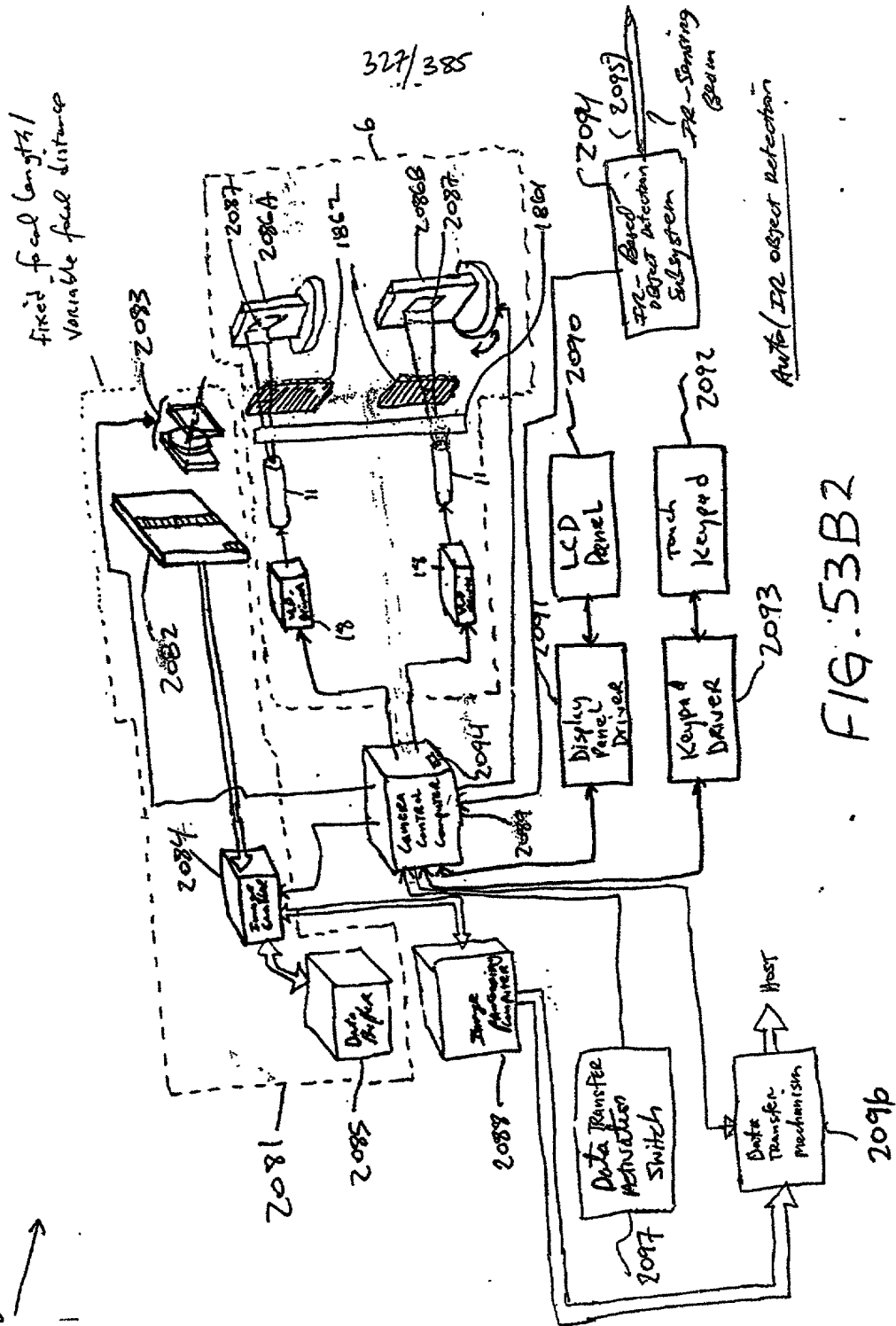
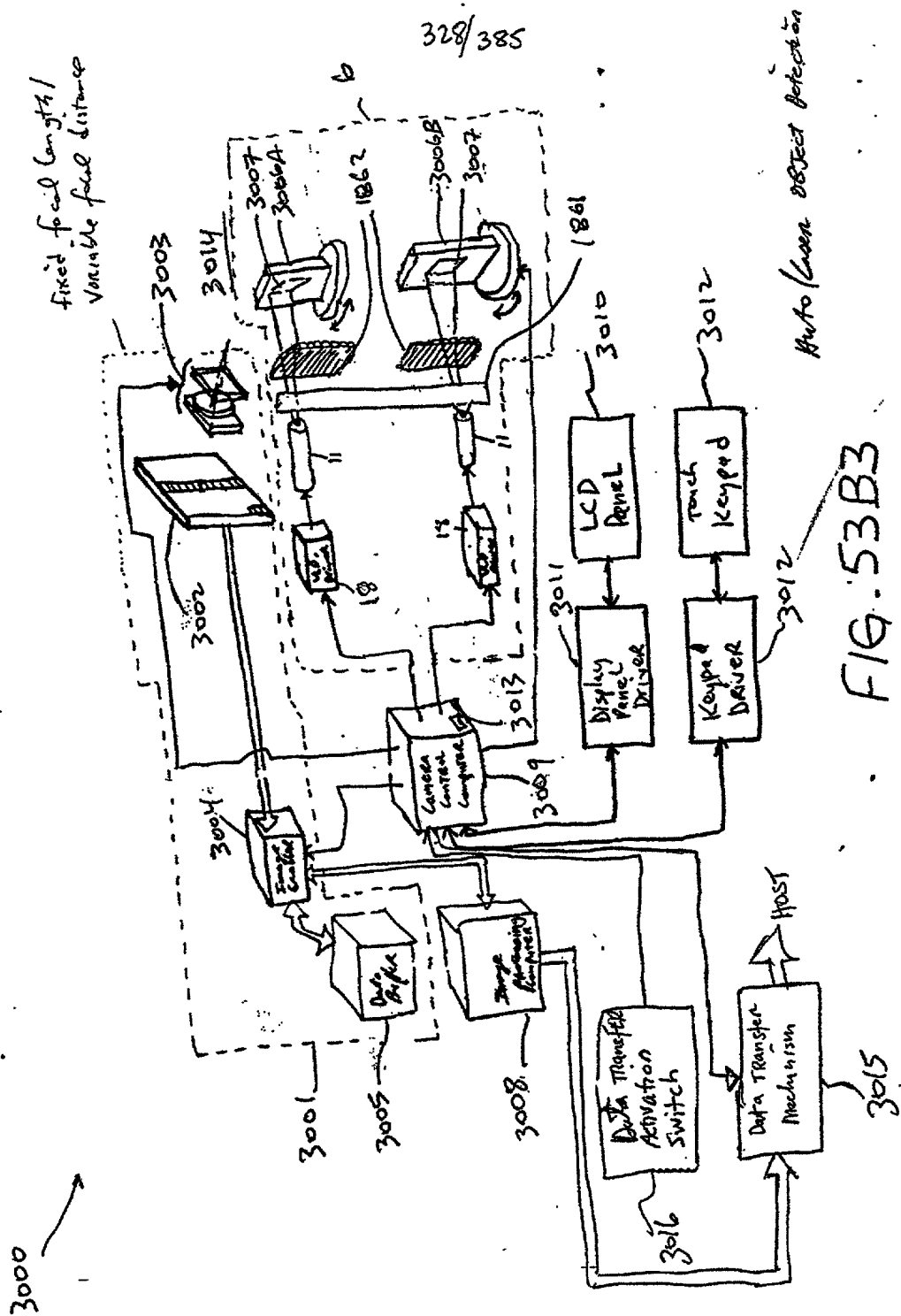


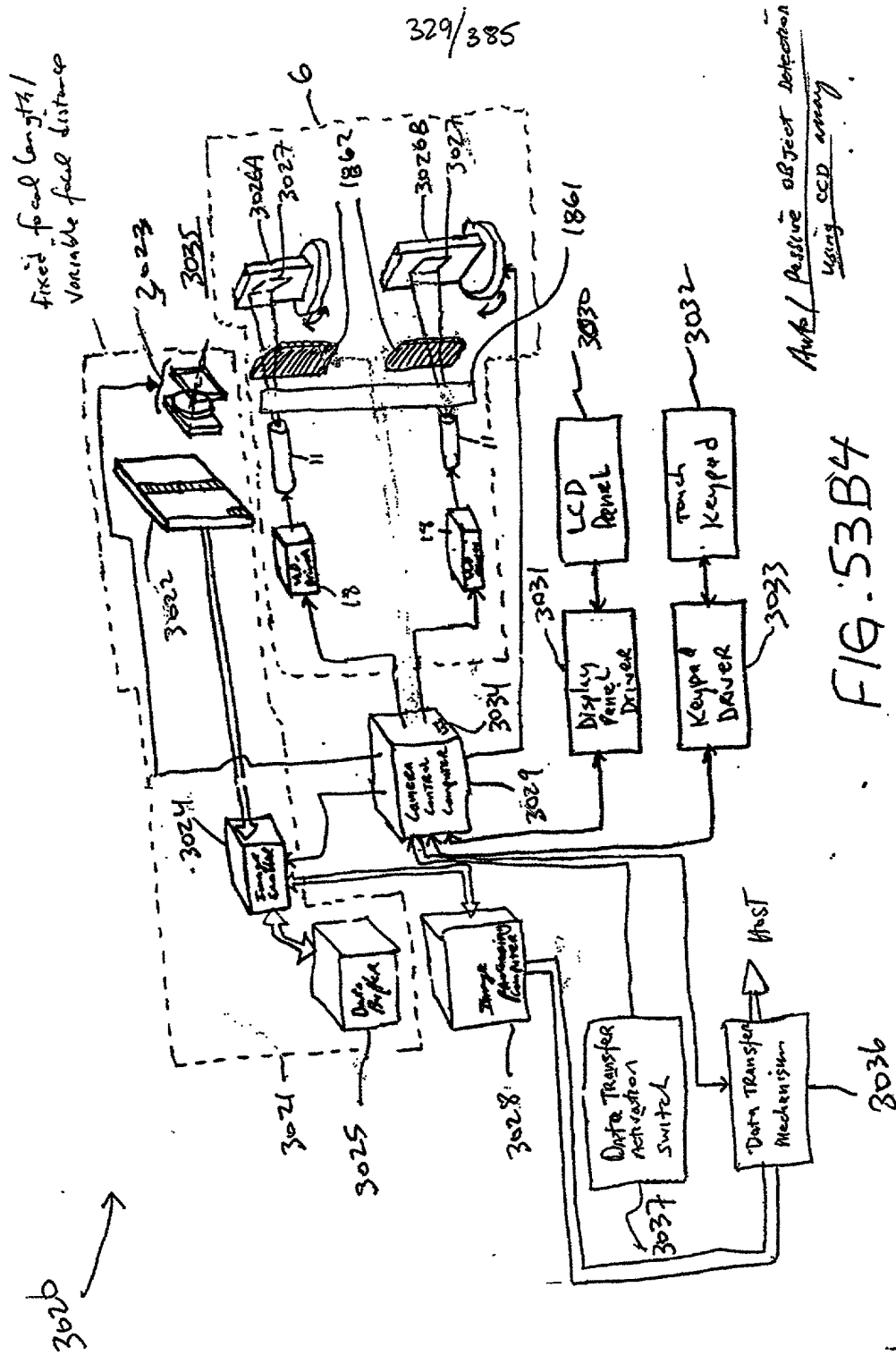
FIG. 53B1

2080





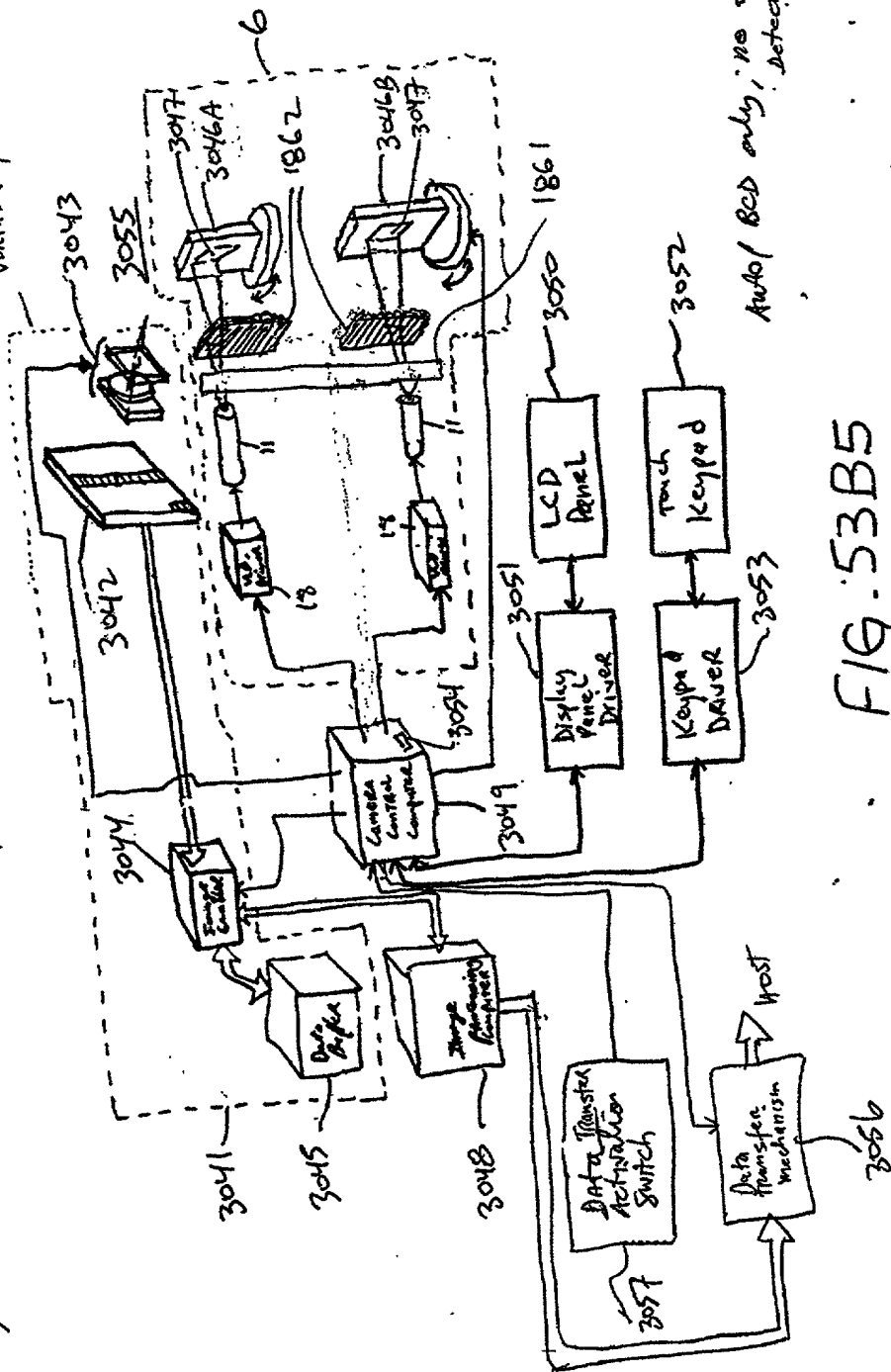
NAME	DATE	TIME	PLACE	REMARKS
Wm. H. H. H.	1877	10:30	St. Paul	Arrived
Wm. H. H. H.	1877	11:00	St. Paul	Left
Wm. H. H. H.	1877	11:30	St. Paul	Arrived
Wm. H. H. H.	1877	12:00	St. Paul	Left
Wm. H. H. H.	1877	12:30	St. Paul	Arrived
Wm. H. H. H.	1877	13:00	St. Paul	Left
Wm. H. H. H.	1877	13:30	St. Paul	Arrived
Wm. H. H. H.	1877	14:00	St. Paul	Left
Wm. H. H. H.	1877	14:30	St. Paul	Arrived
Wm. H. H. H.	1877	15:00	St. Paul	Left
Wm. H. H. H.	1877	15:30	St. Paul	Arrived
Wm. H. H. H.	1877	16:00	St. Paul	Left
Wm. H. H. H.	1877	16:30	St. Paul	Arrived
Wm. H. H. H.	1877	17:00	St. Paul	Left
Wm. H. H. H.	1877	17:30	St. Paul	Arrived
Wm. H. H. H.	1877	18:00	St. Paul	Left
Wm. H. H. H.	1877	18:30	St. Paul	Arrived
Wm. H. H. H.	1877	19:00	St. Paul	Left
Wm. H. H. H.	1877	19:30	St. Paul	Arrived
Wm. H. H. H.	1877	20:00	St. Paul	Left
Wm. H. H. H.	1877	20:30	St. Paul	Arrived
Wm. H. H. H.	1877	21:00	St. Paul	Left
Wm. H. H. H.	1877	21:30	St. Paul	Arrived
Wm. H. H. H.	1877	22:00	St. Paul	Left
Wm. H. H. H.	1877	22:30	St. Paul	Arrived
Wm. H. H. H.	1877	23:00	St. Paul	Left
Wm. H. H. H.	1877	23:30	St. Paul	Arrived
Wm. H. H. H.	1877	24:00	St. Paul	Left



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fixed focal length/  
variable focal distance

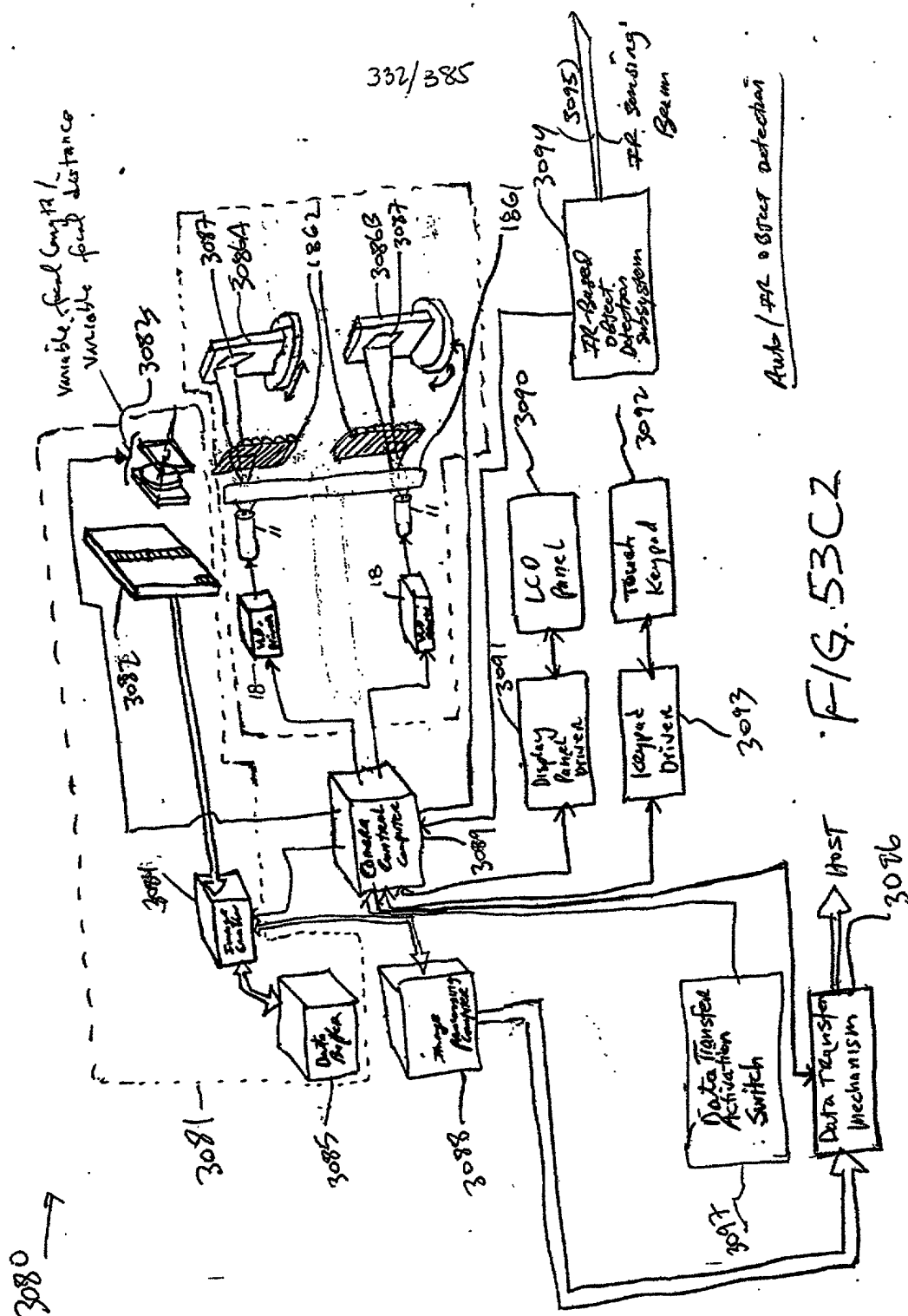
3040



Auto/ Bcd only, no object detection

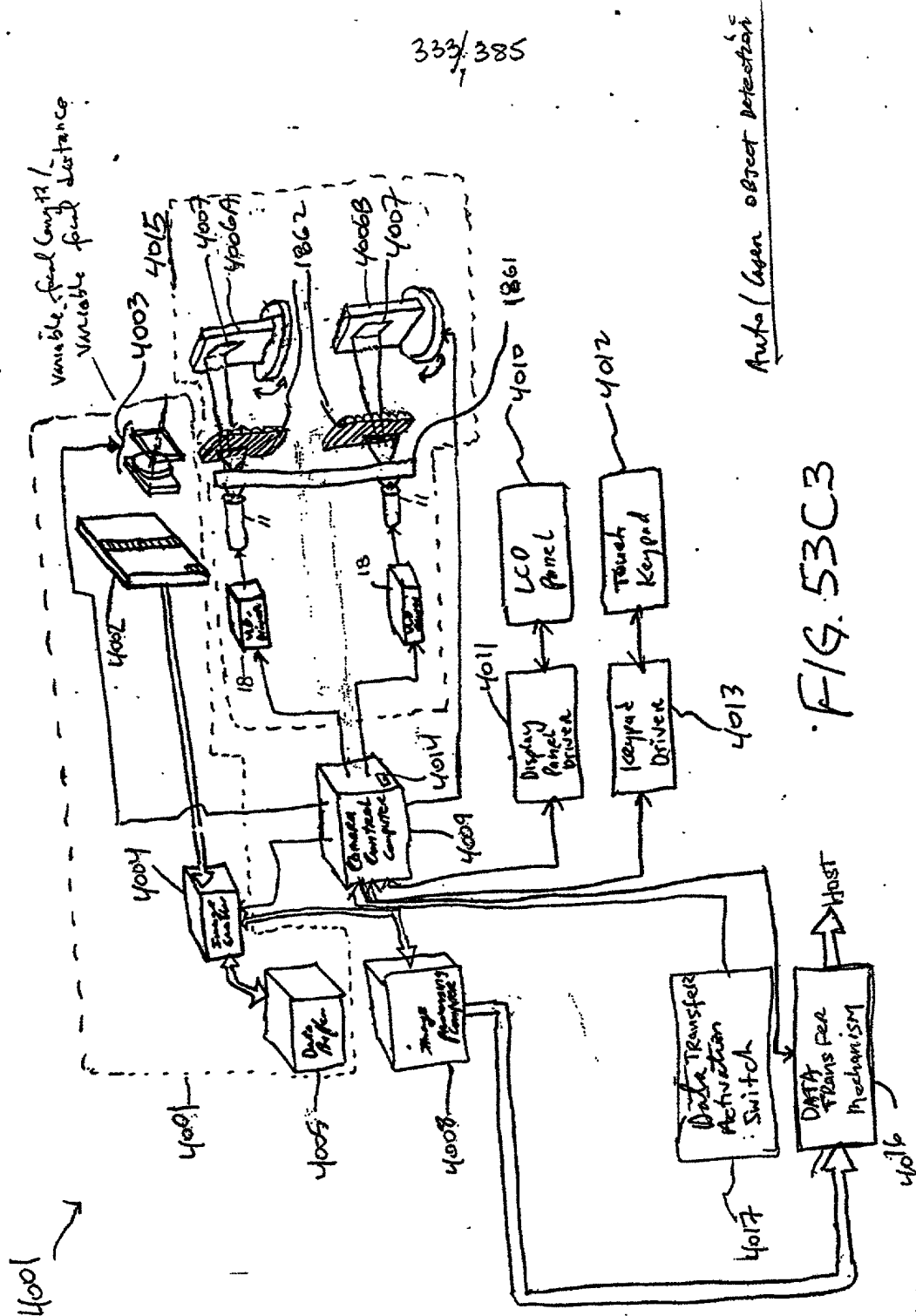
FIG. 53B5



[illegible]



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Auto/Lean object detection

FIG. 53C3

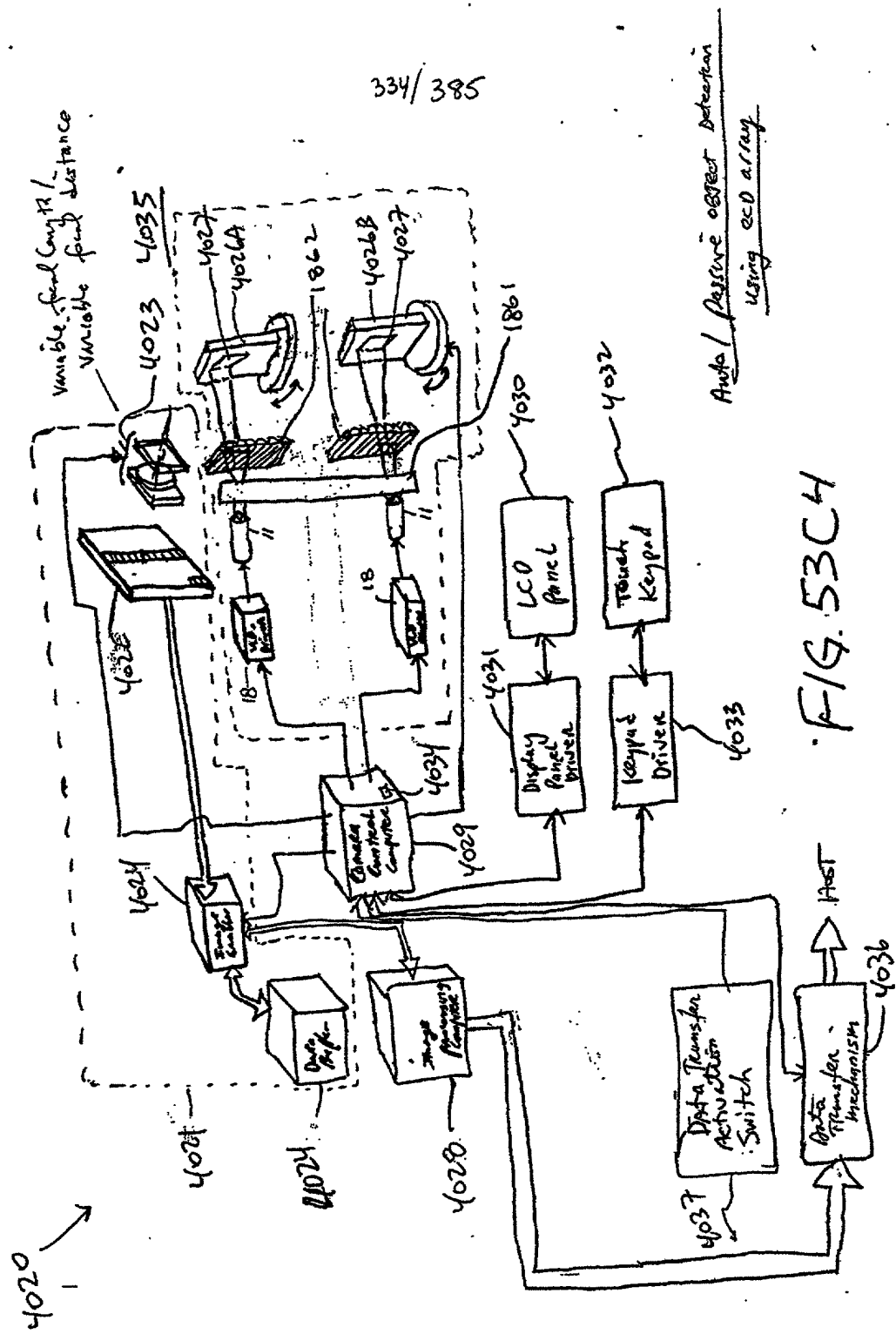
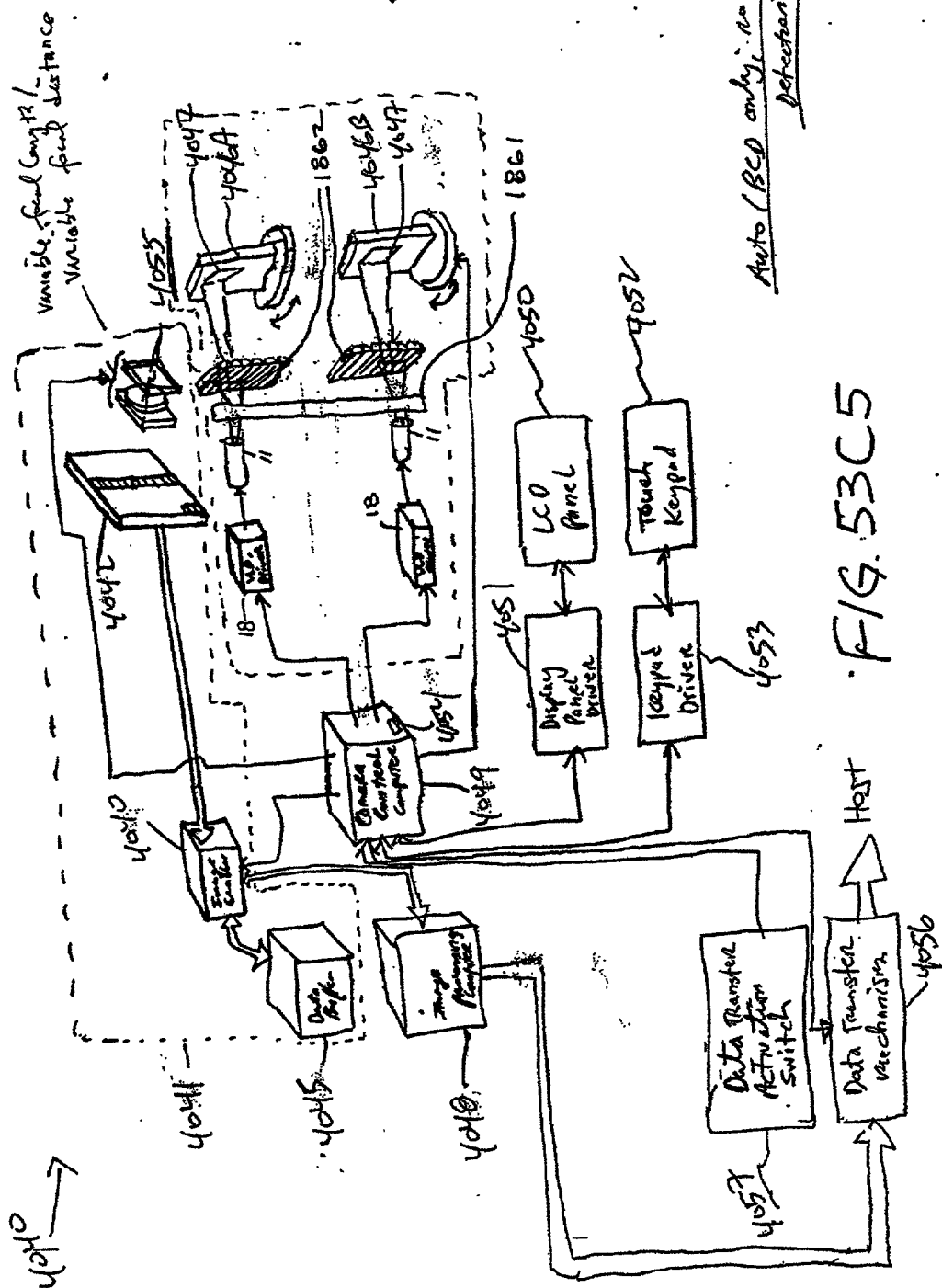


FIG. 53CH

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Auto (BCD only) no offset detection

FIG. 53C5

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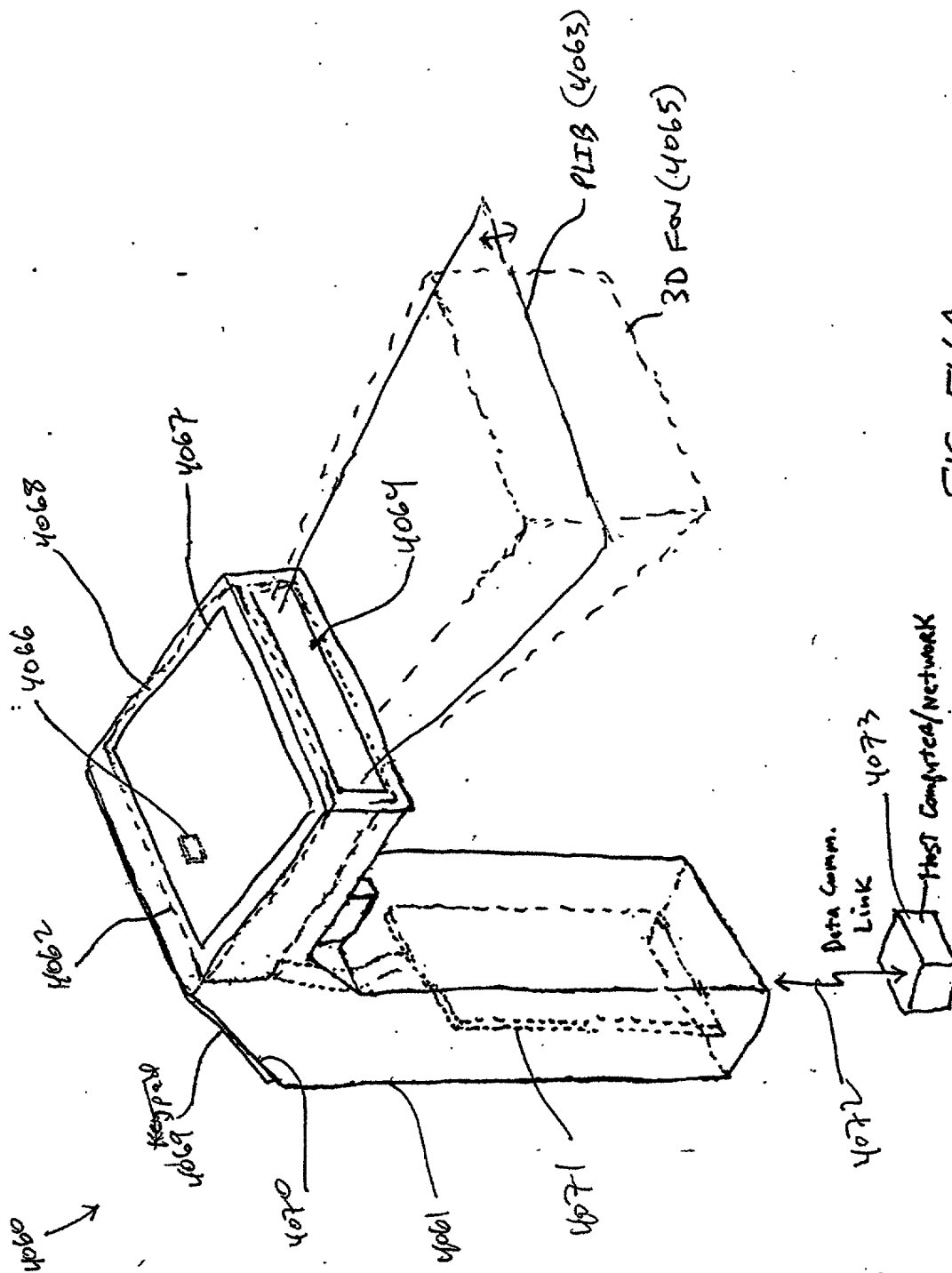


FIG. 54A

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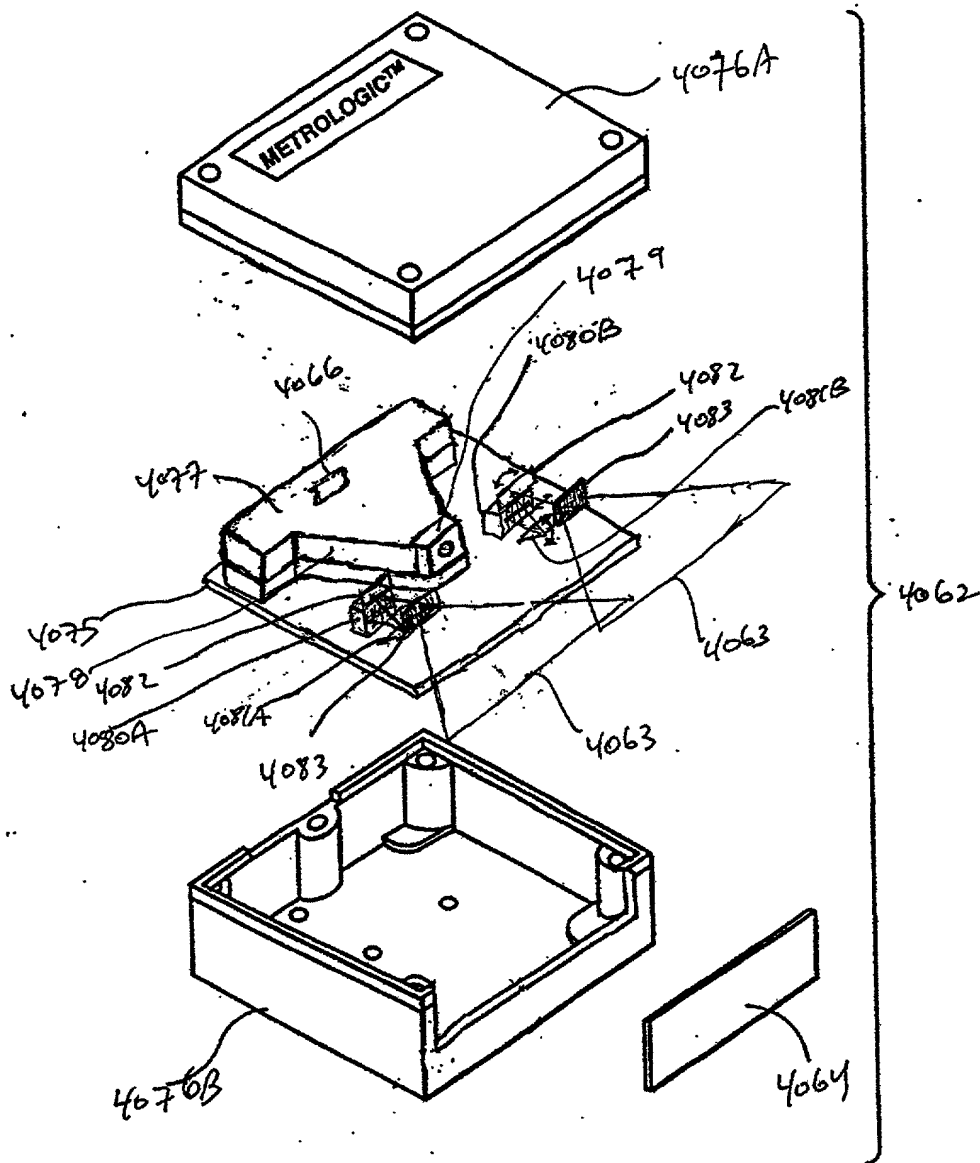


FIG. 54B

(Dual mirrors)  
Fig. 175A-SP

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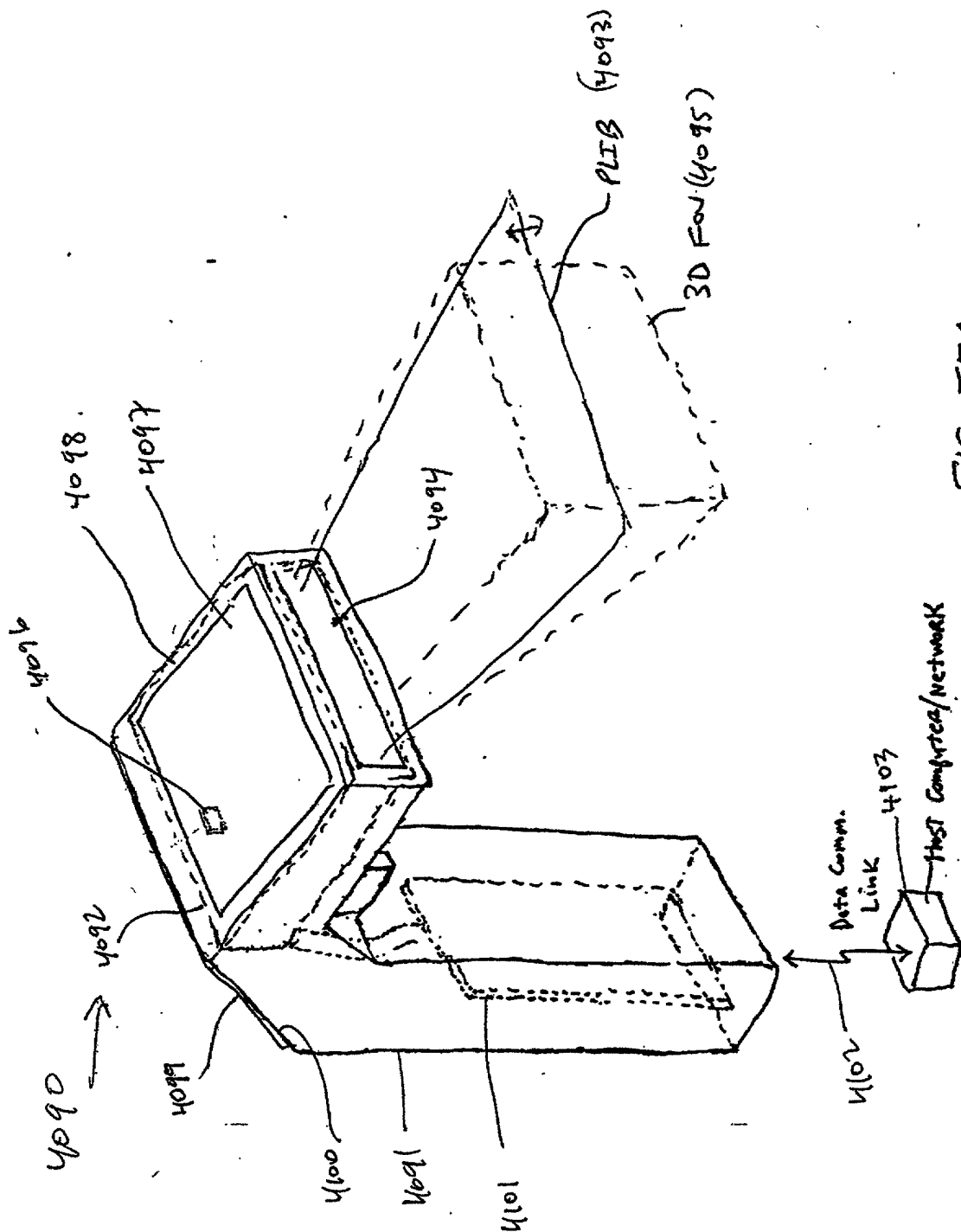


FIG. 55A

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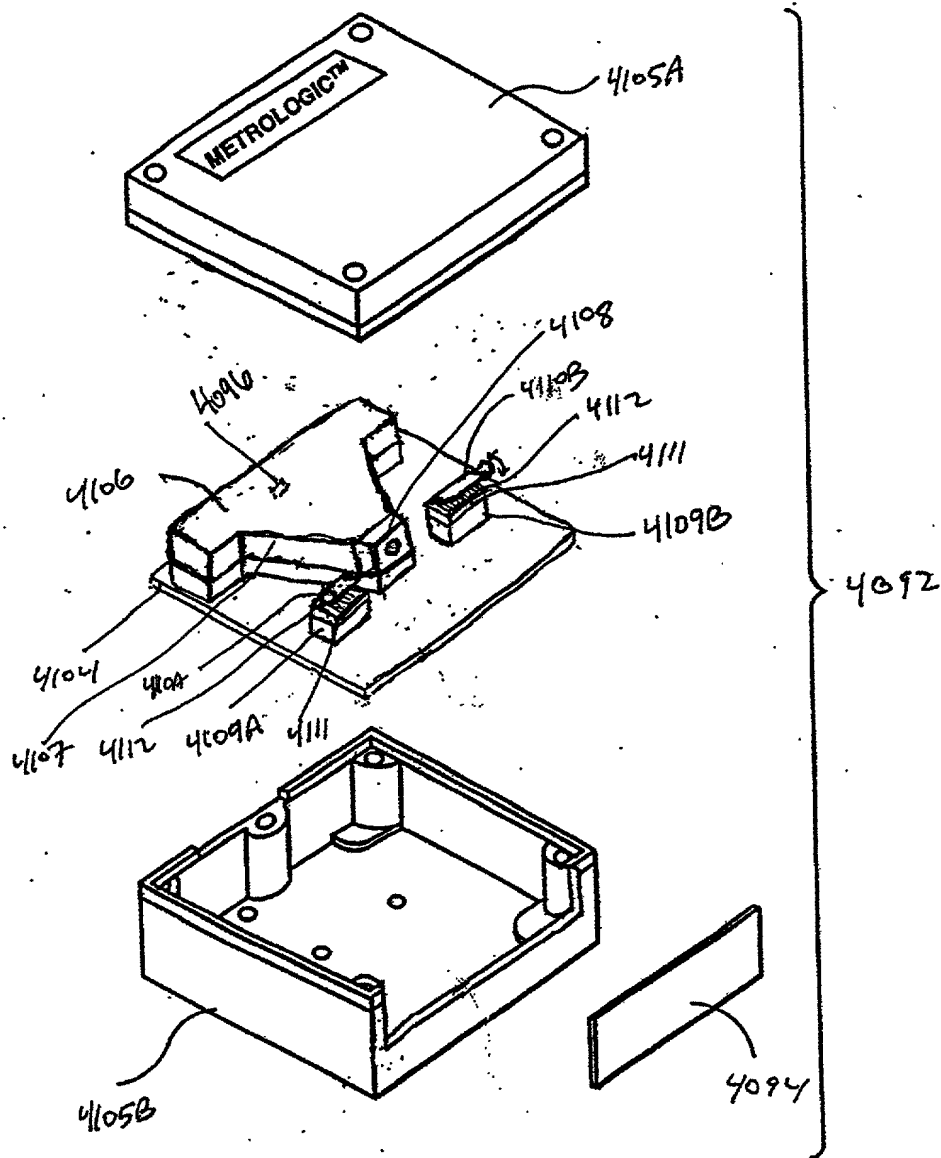
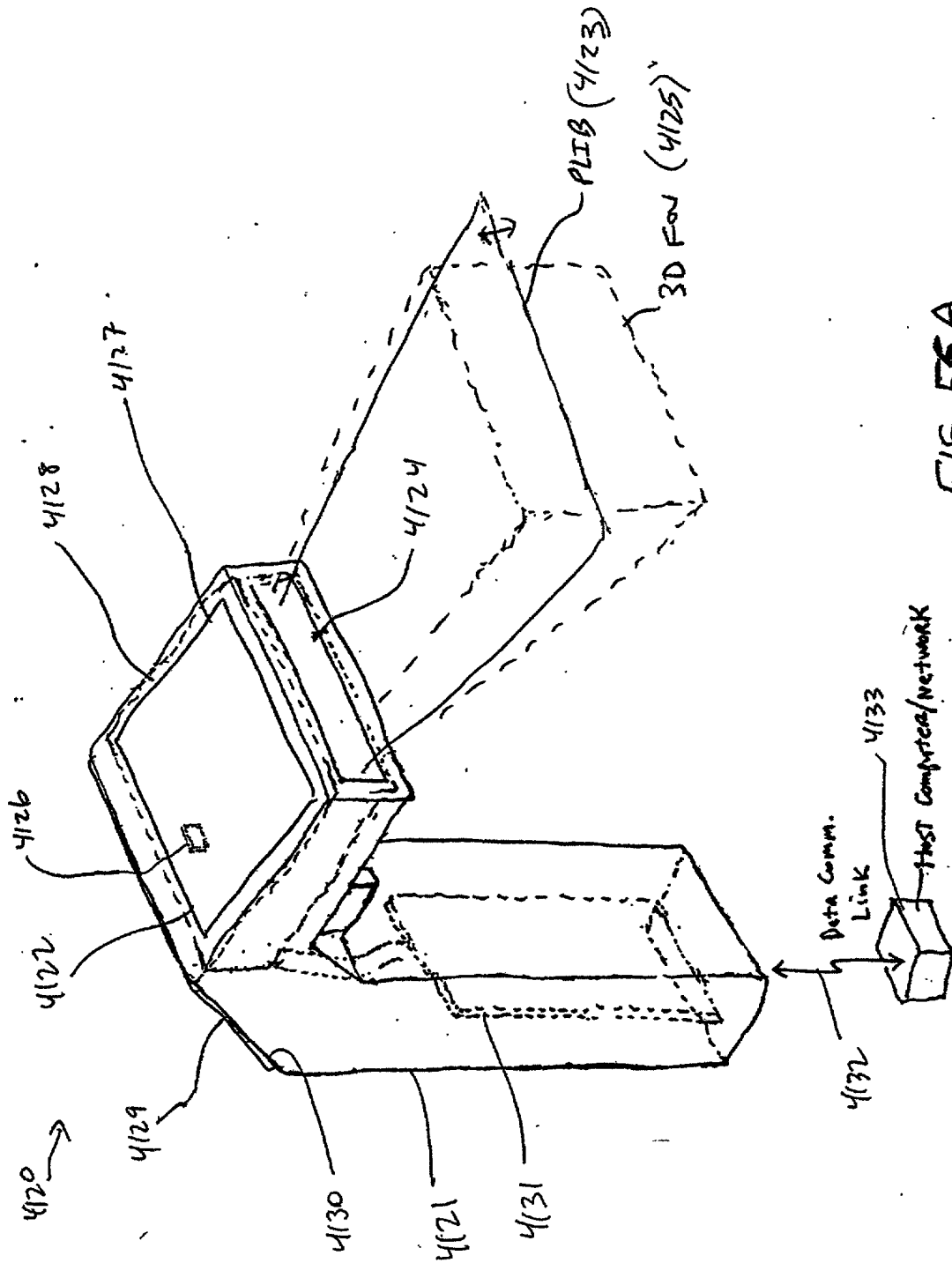


FIG. 55B

Brooks cell -  
Fig. 136A-6B

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[illegible]



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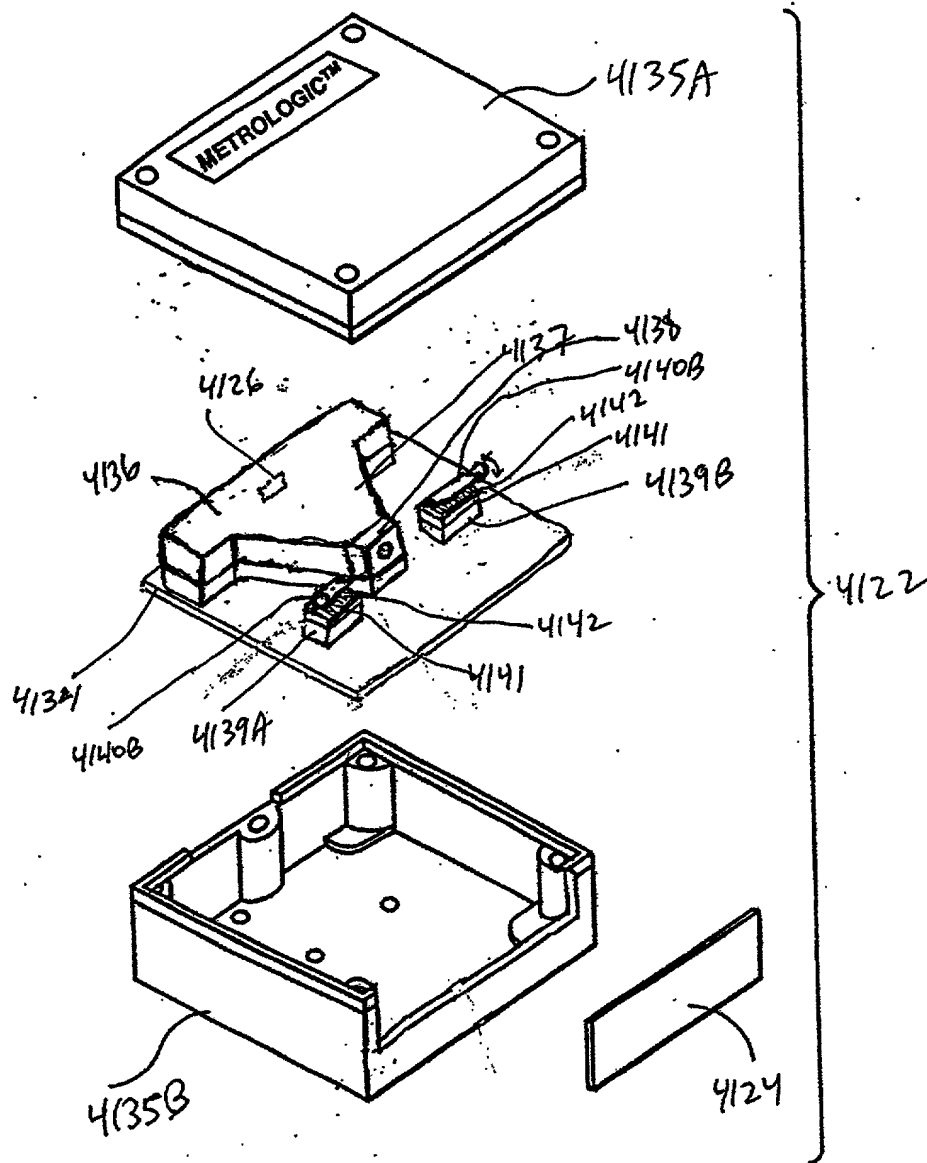


FIG. 56B

DM  
Fig. 1I 7A-7C

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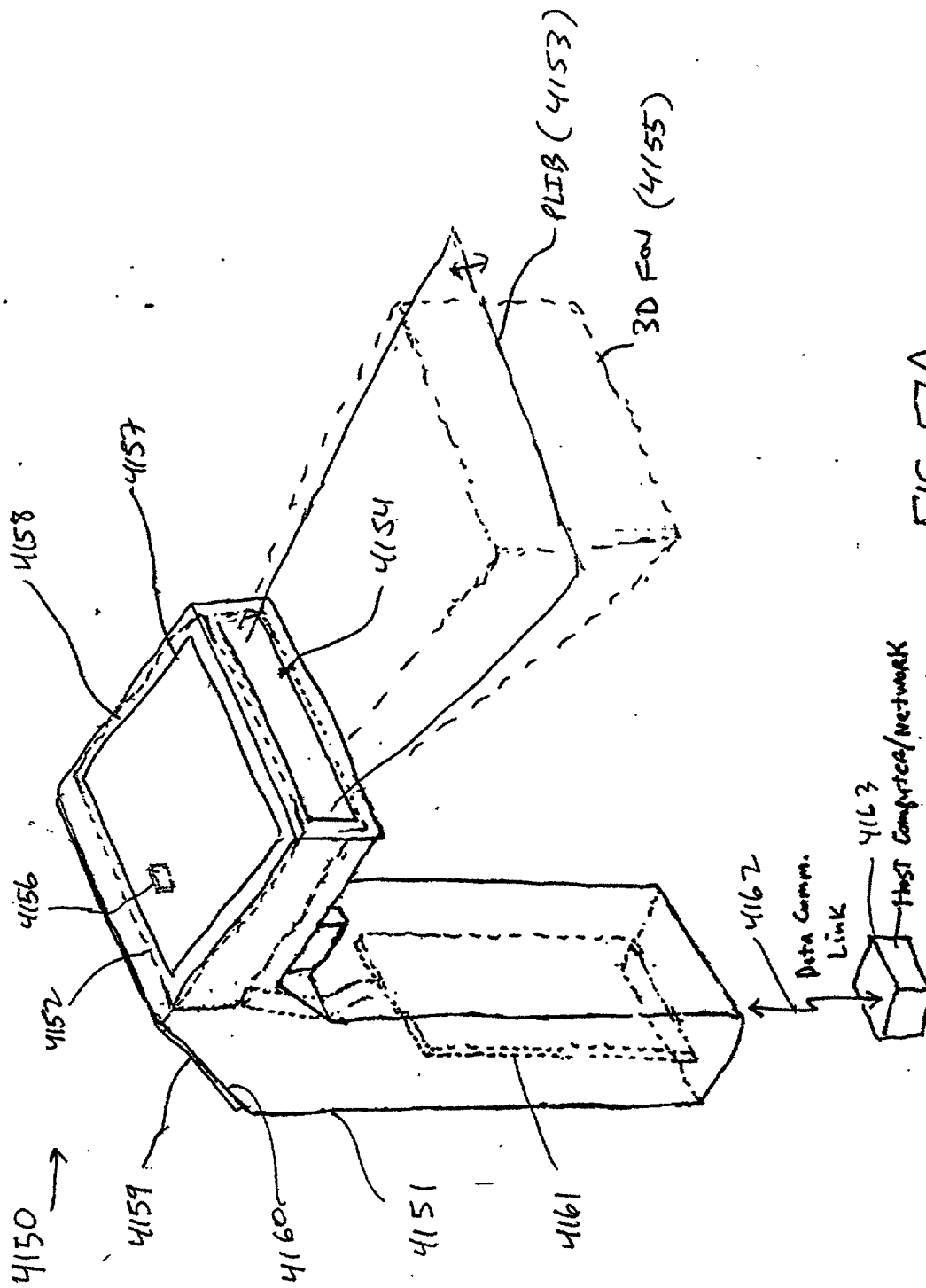


FIG. 57A

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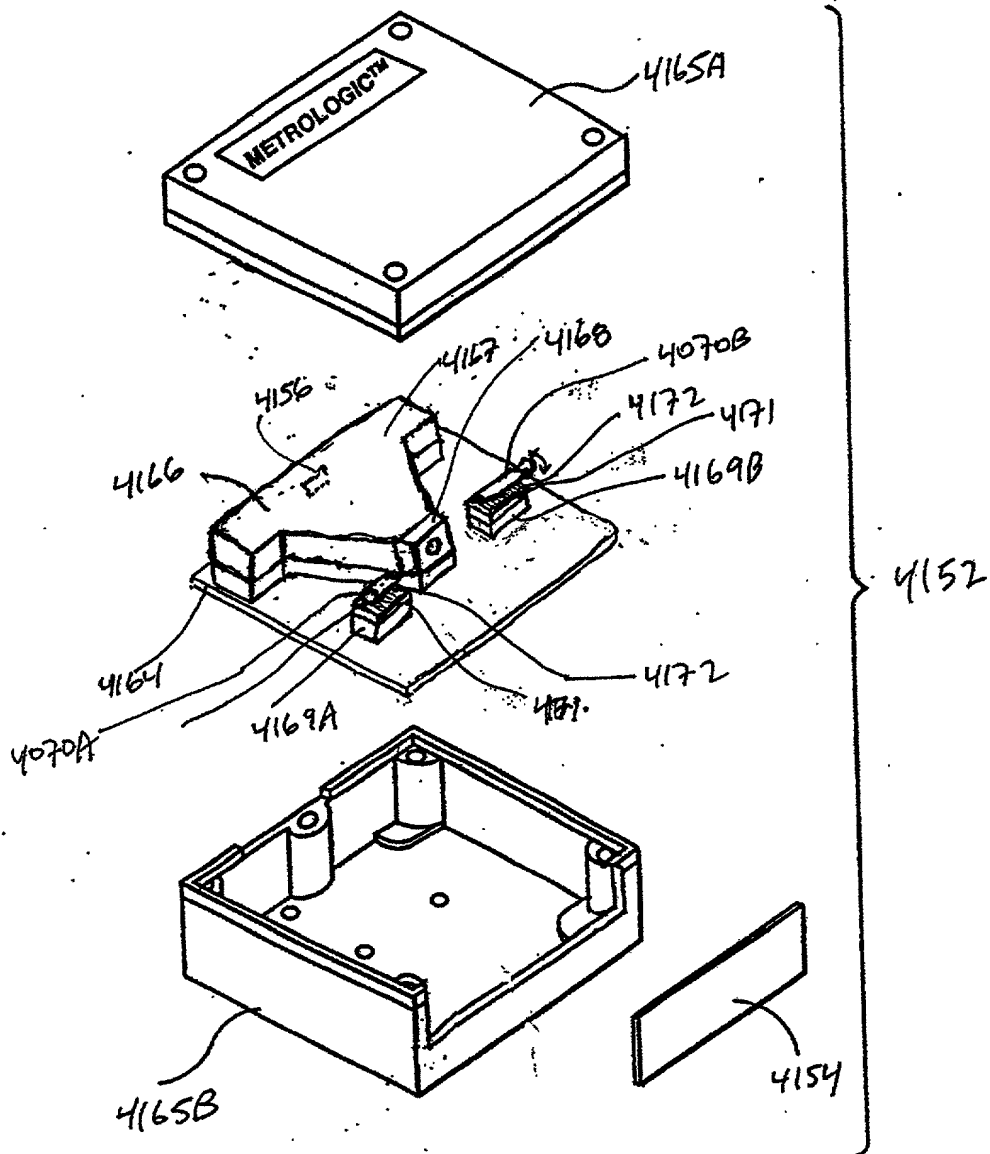


FIG. 57B

Please only LCR  
on panel  
Fys 178F-86

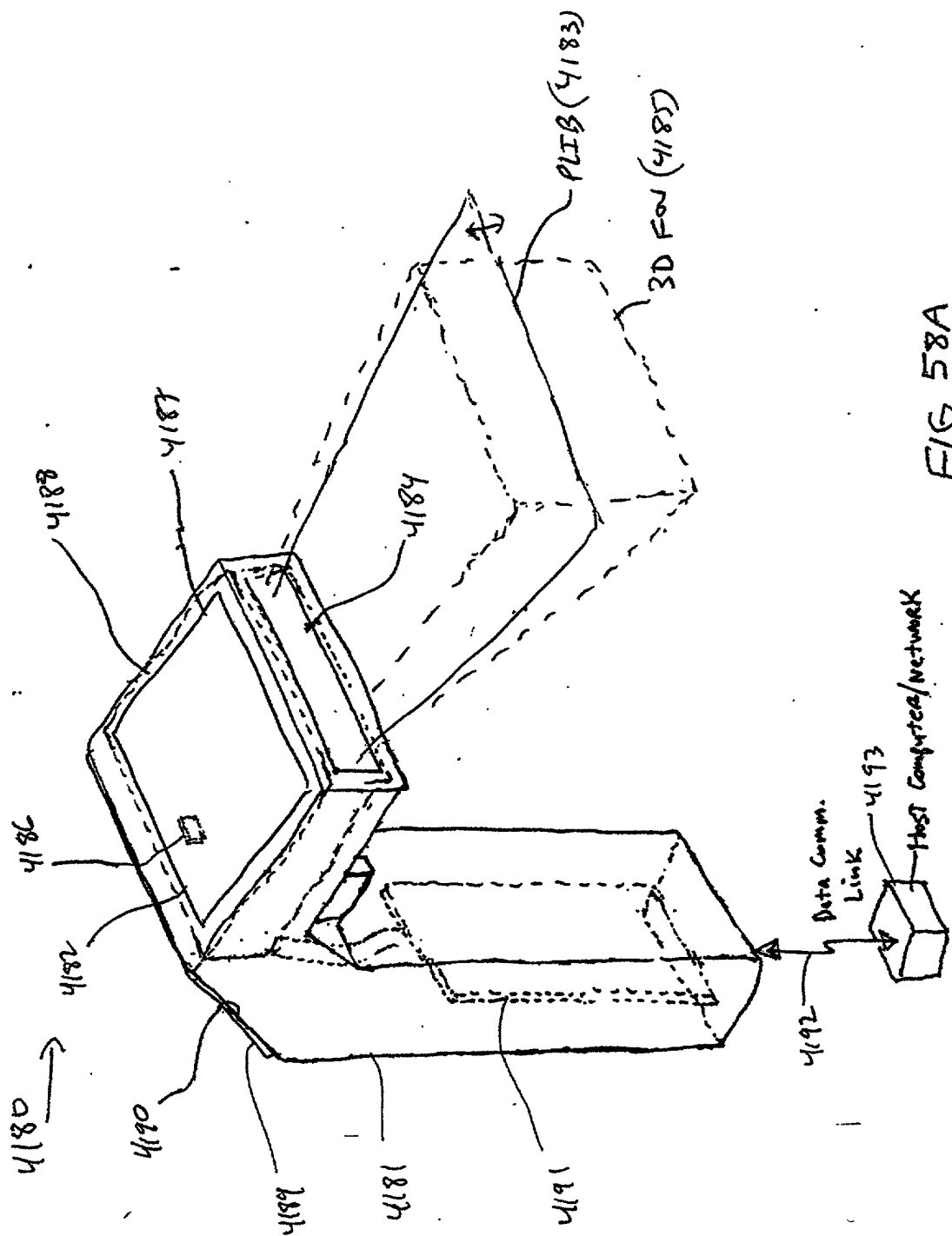


FIG. 58A

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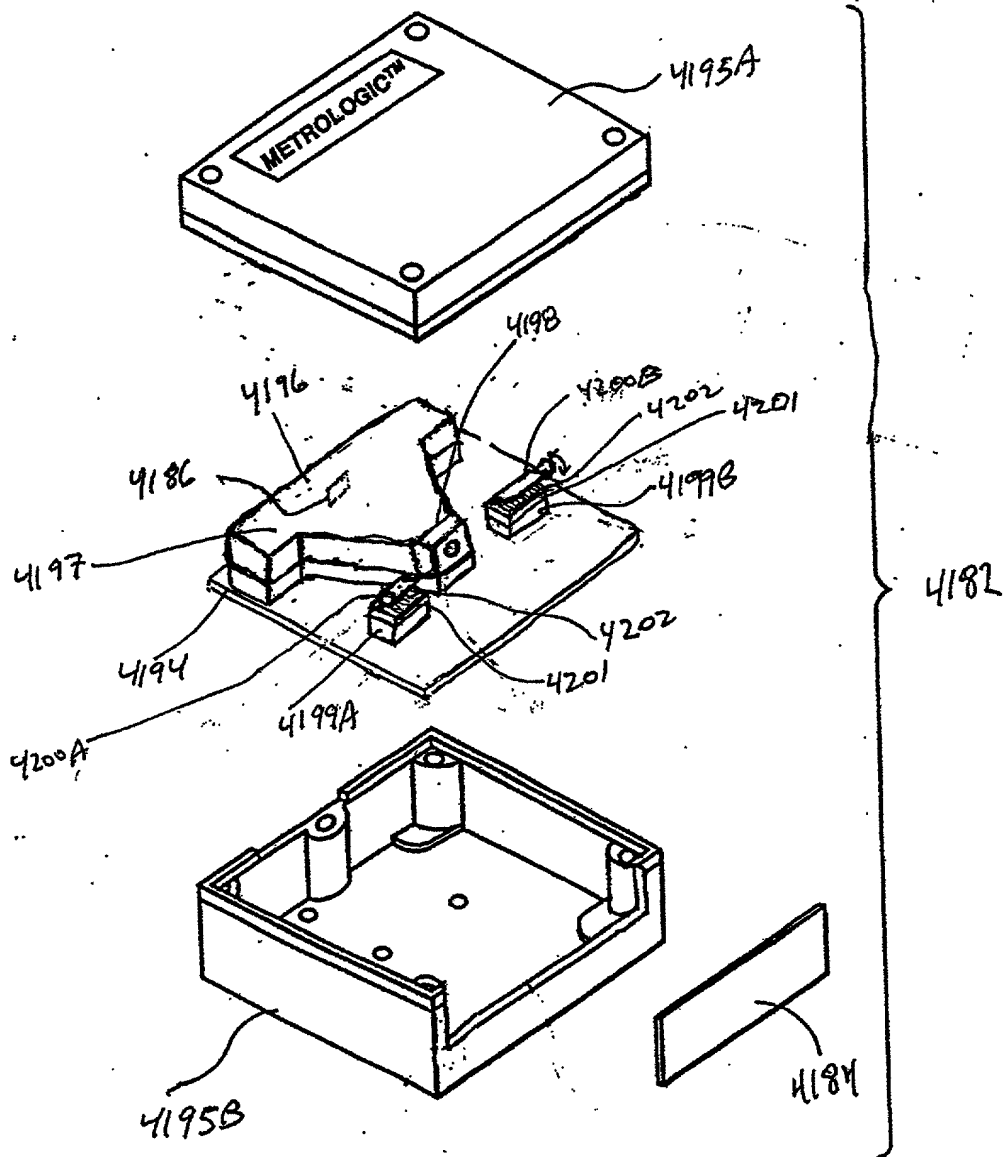


FIG. 58B

115 optical shutter  
Fig. 1714A-14B

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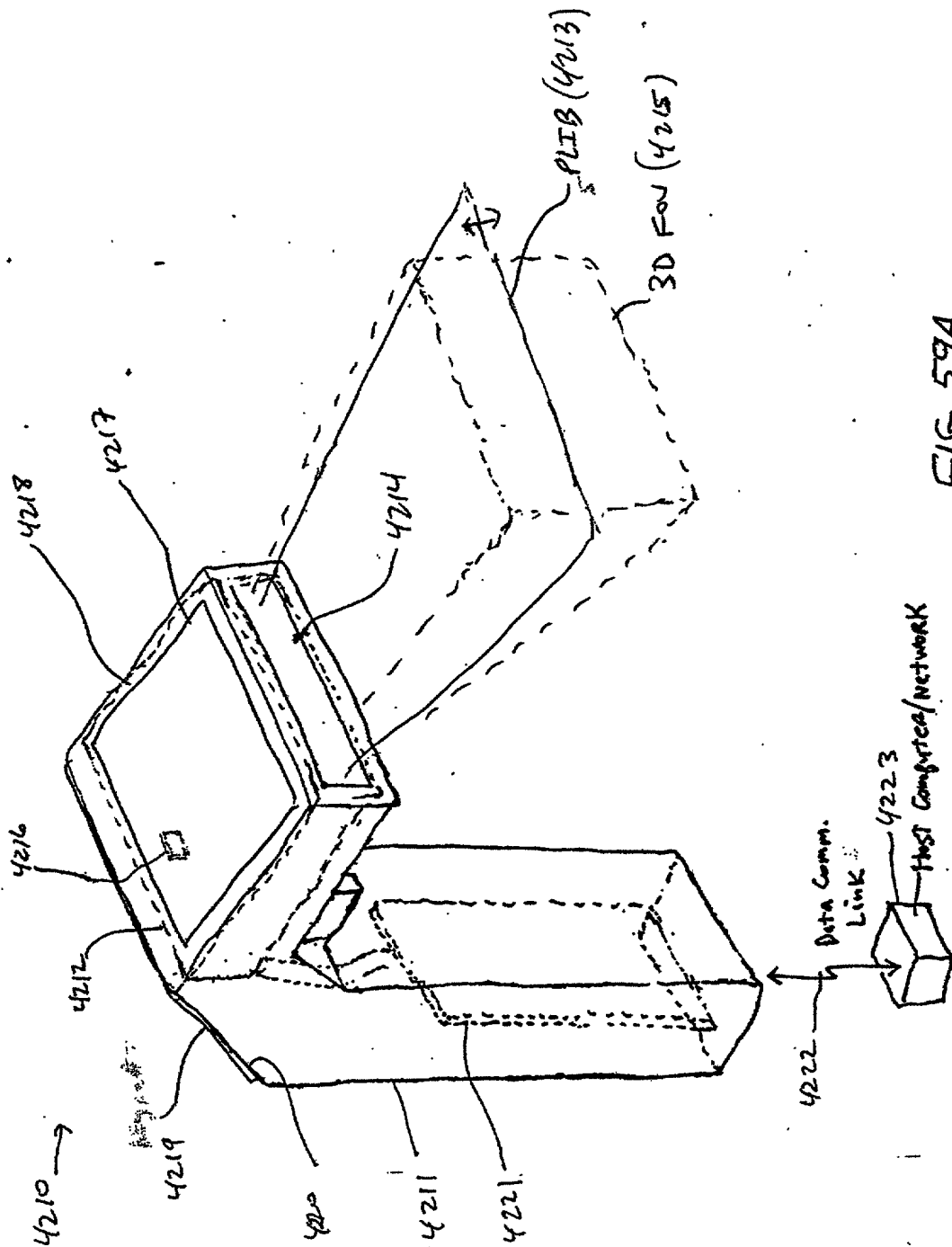


FIG. 59A

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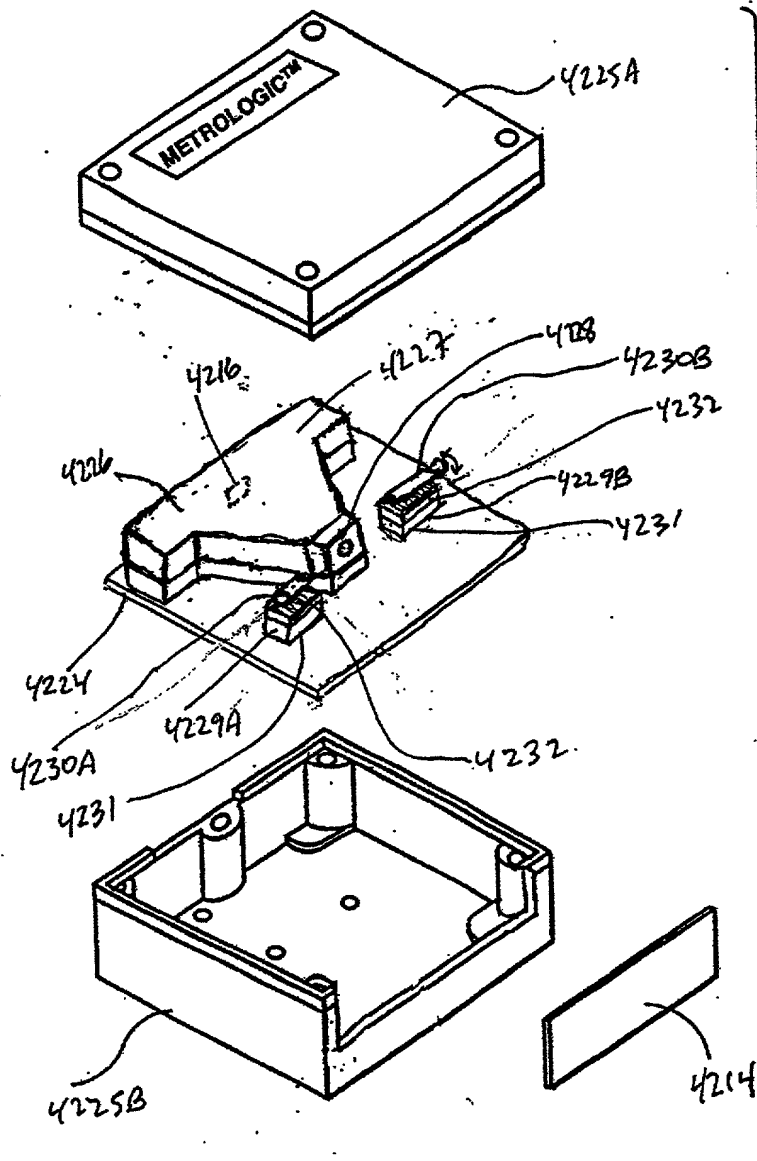


FIG. 59B

MLLD  
Fig. 1E15A-15B

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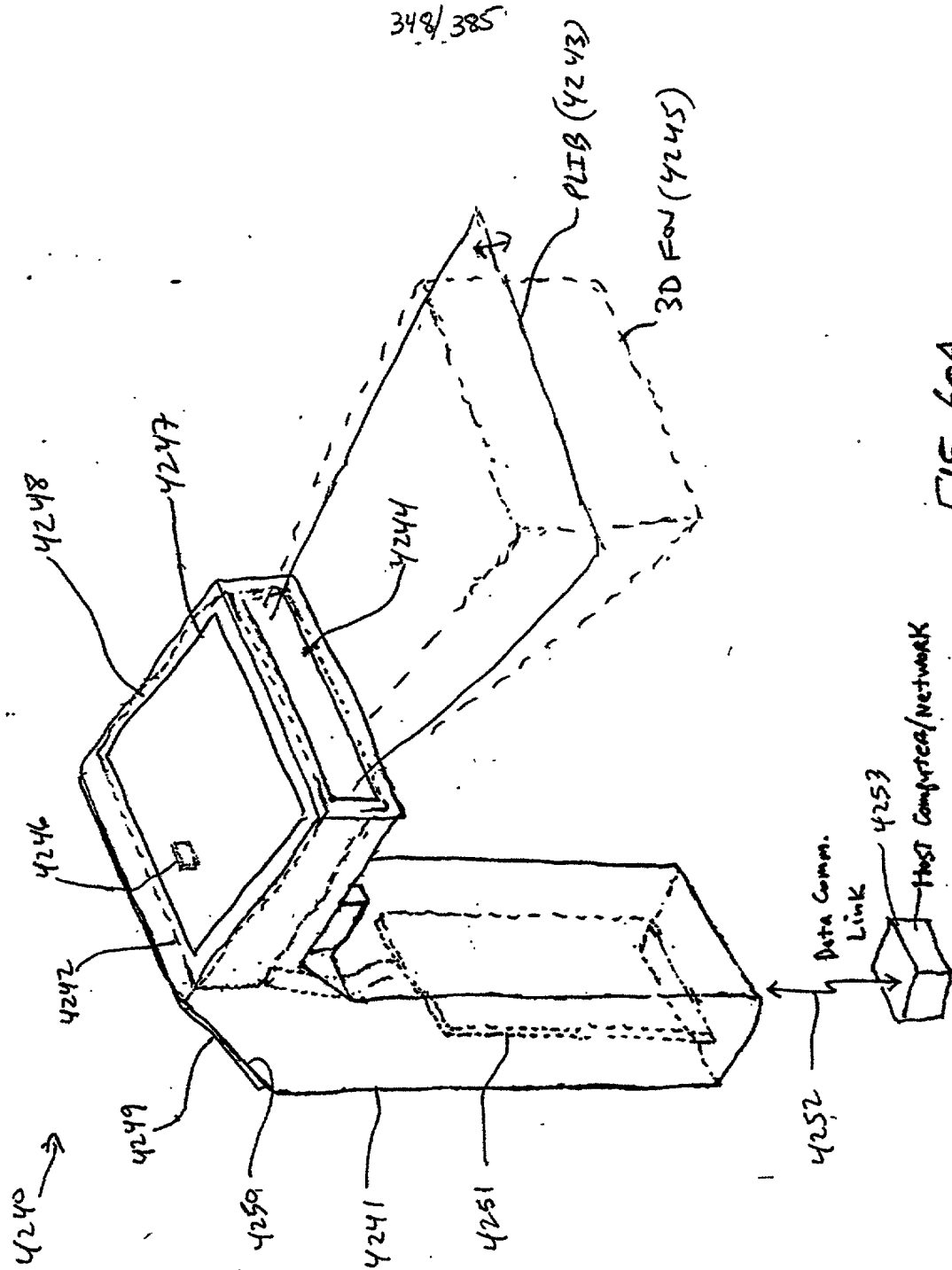


FIG. 60A



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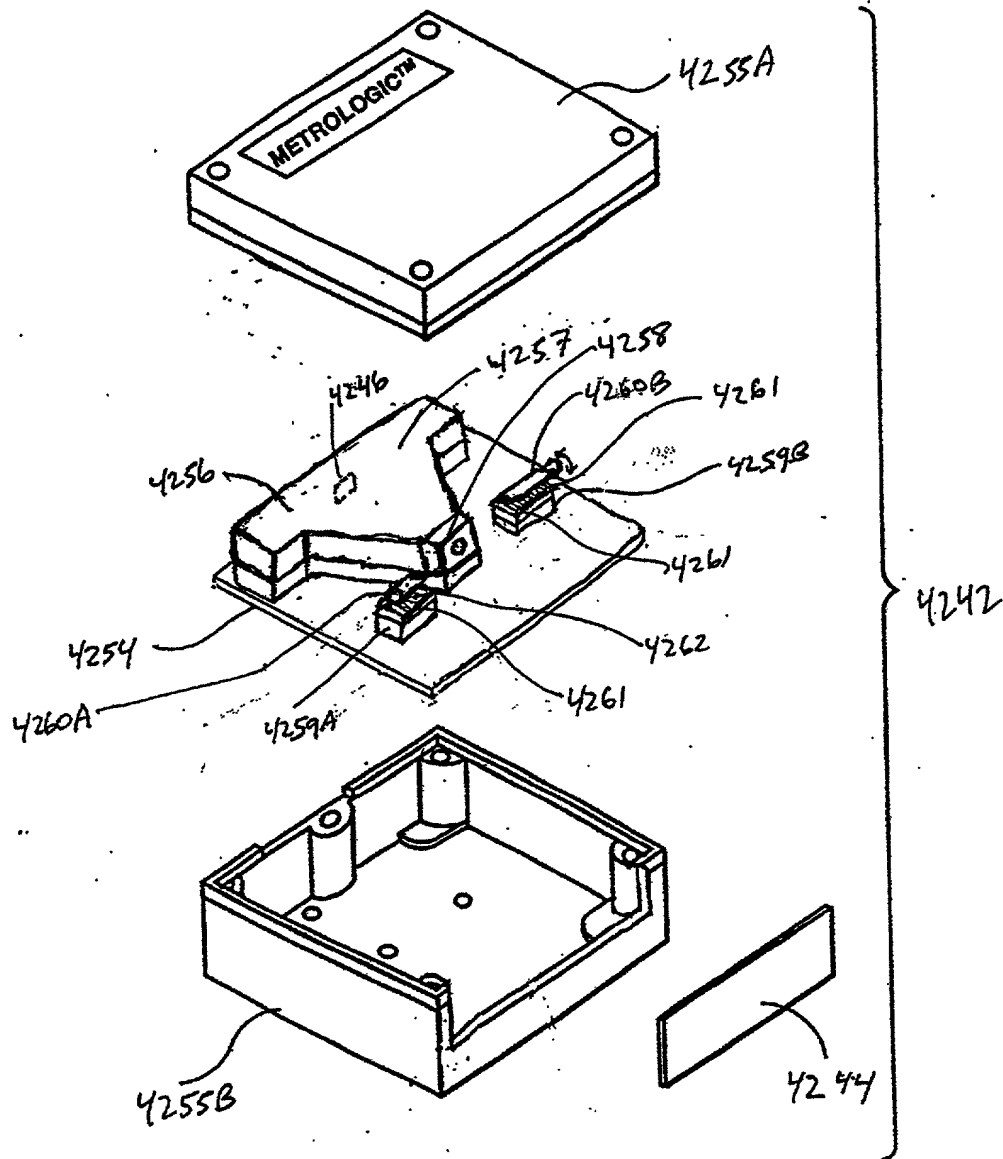


FIG. 60B

Bthalon (Trans. phase mod.)  
Fig. 1 I 17A-17B

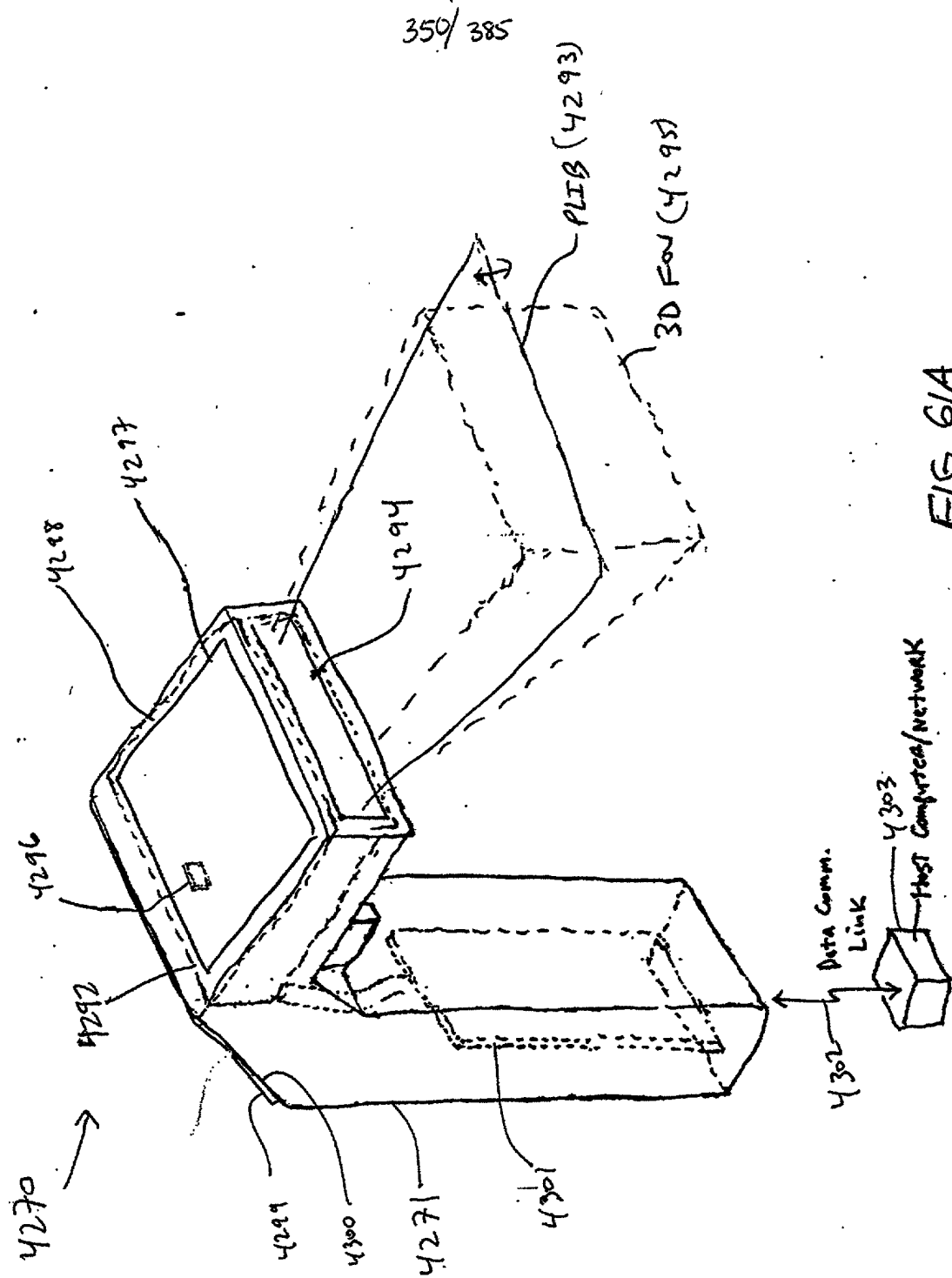


FIG. 61A

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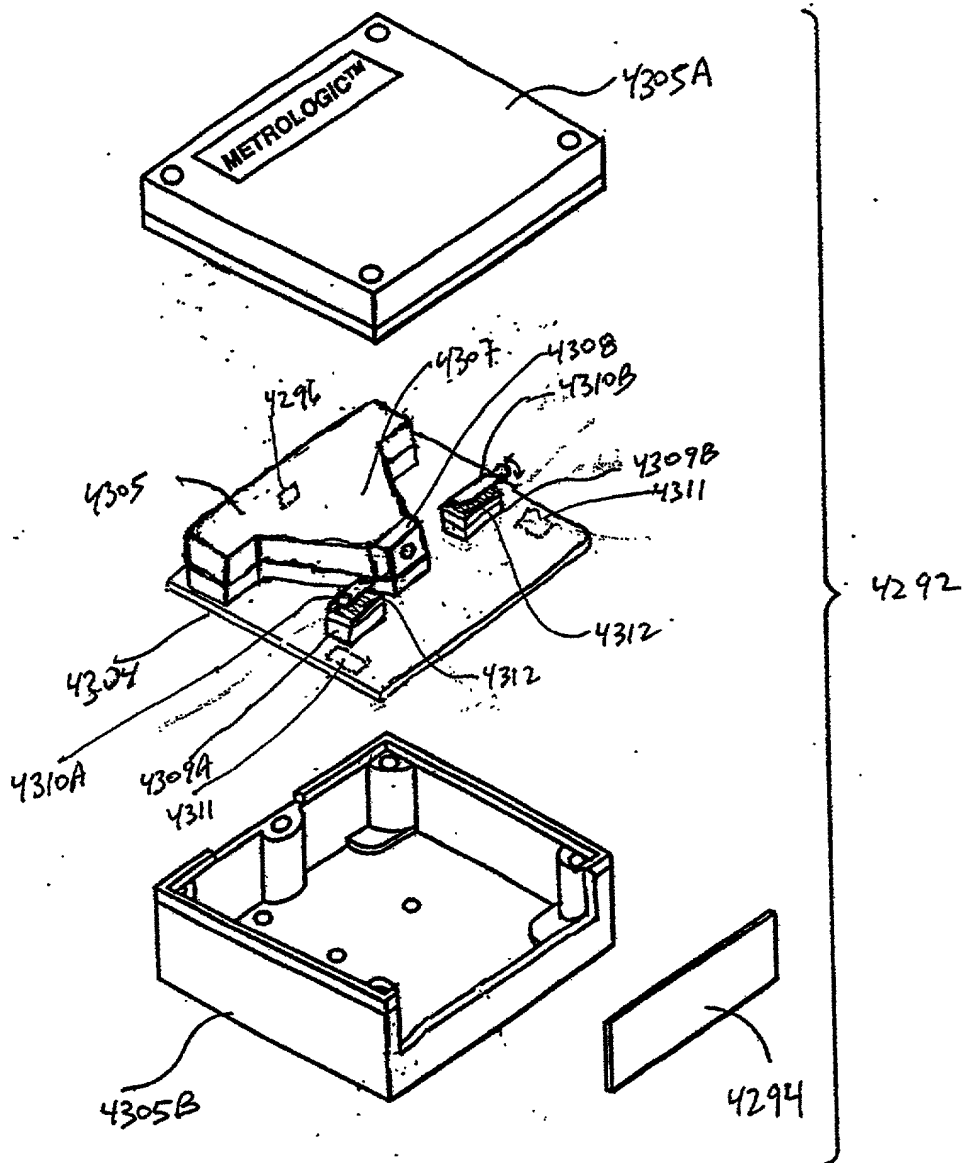


FIG. 61B

mod. hopping

Fig. 119A-19B

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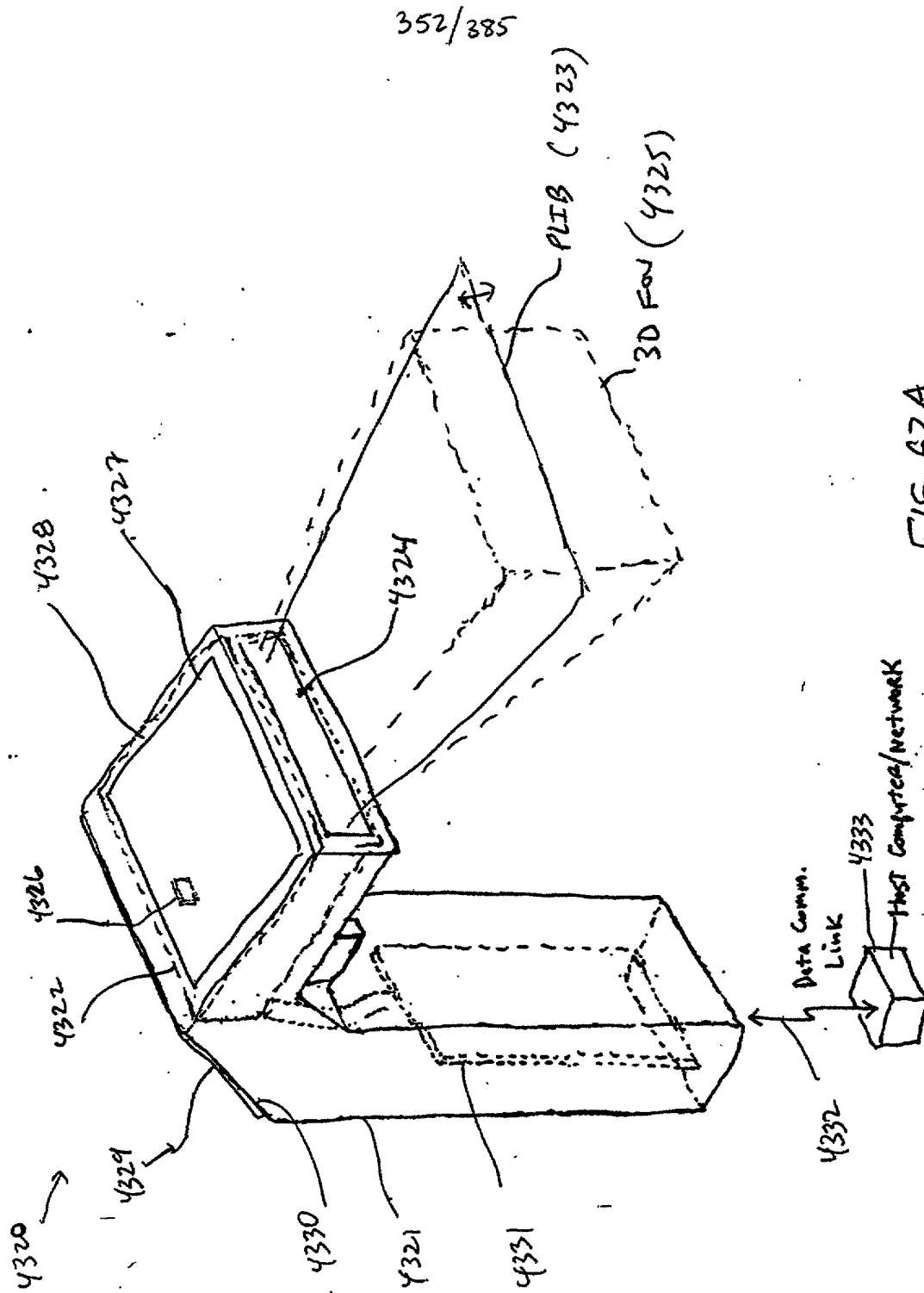


FIG. 62A

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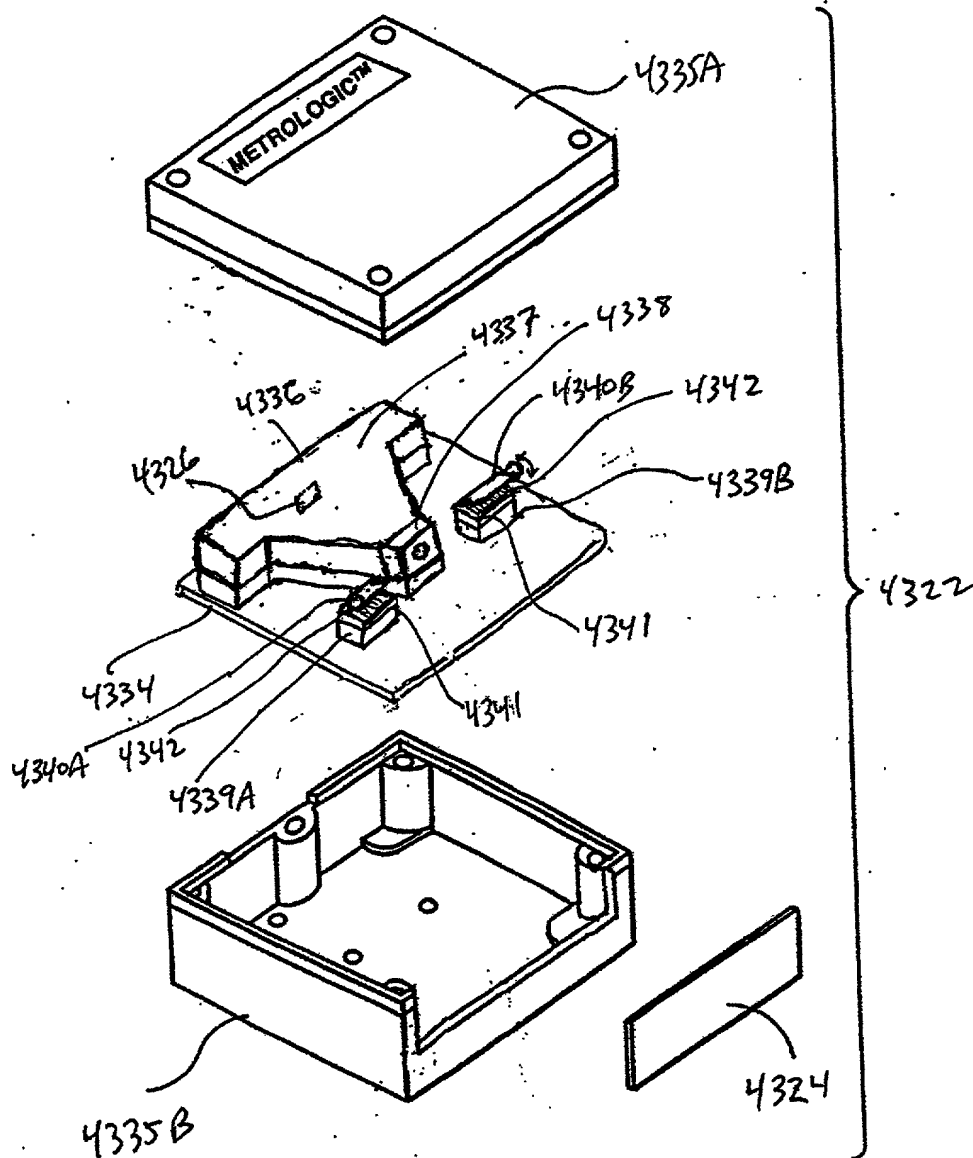


FIG. 62B

Microswitch  
Spot intensity  
mod. panel

Fig. 1F21A-21D

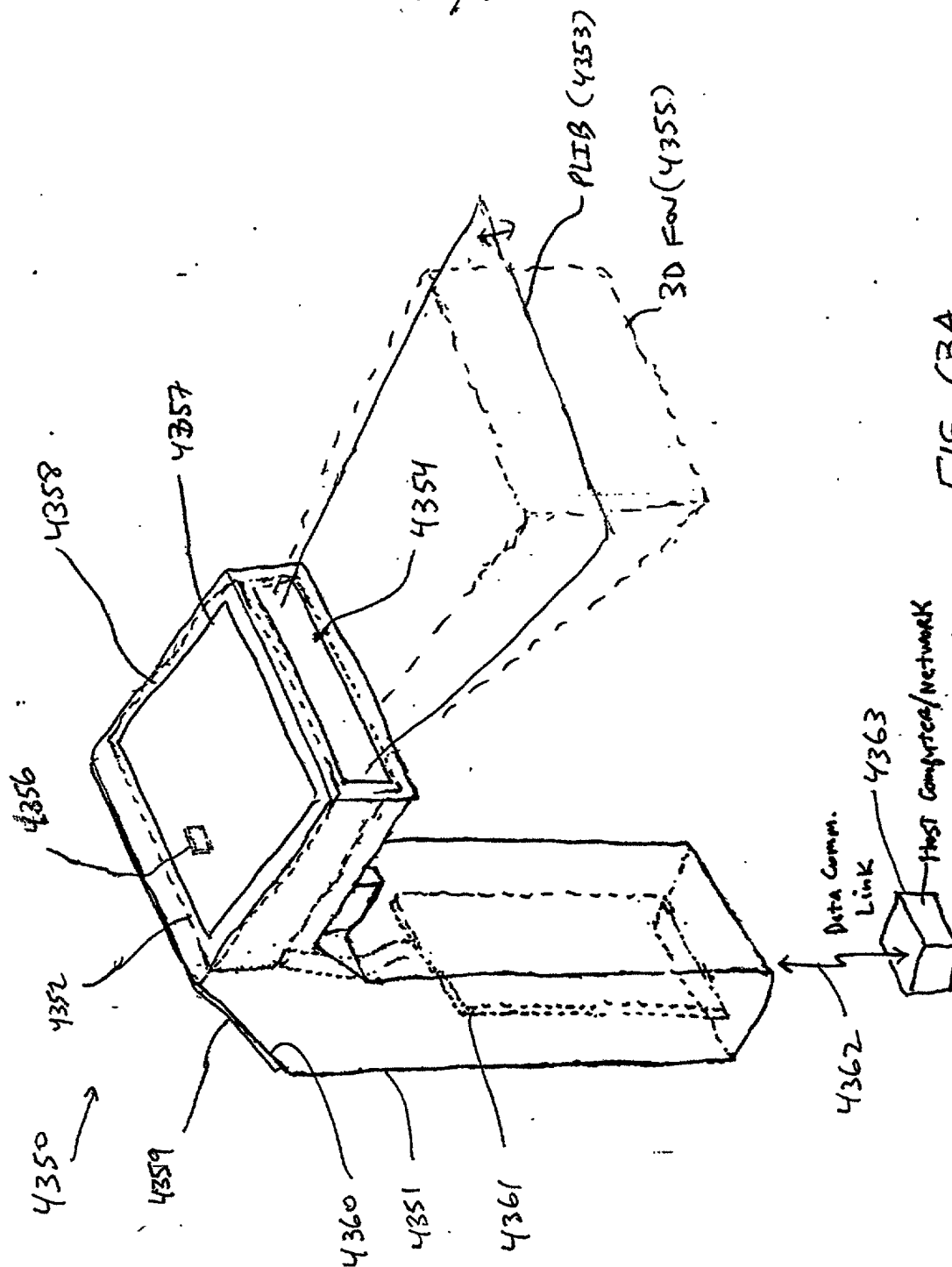
$$354/385$$


FIG. 63A

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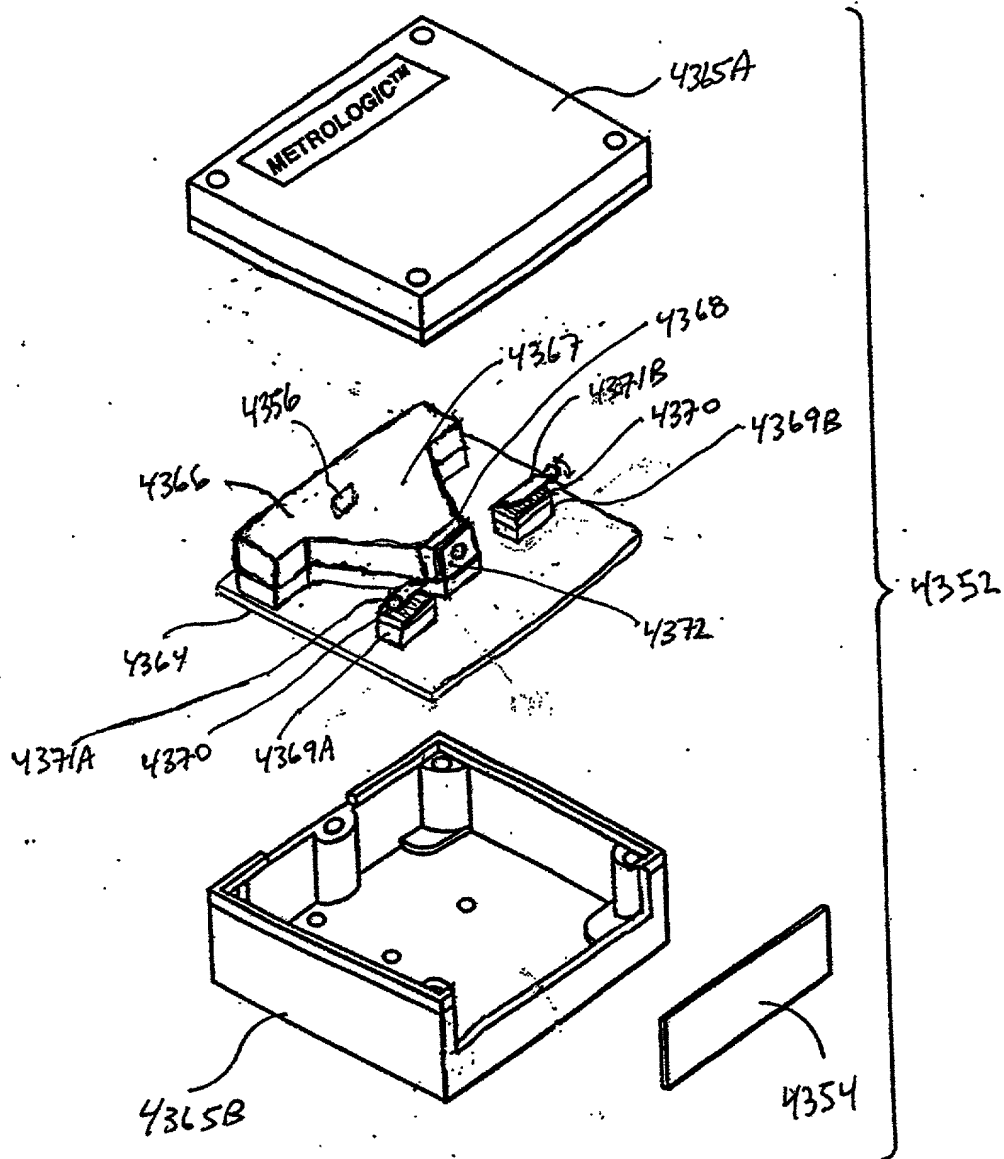


FIG. 63B

ED of  
mechanical fastening IPis  
Fig 1E  
23A-23B

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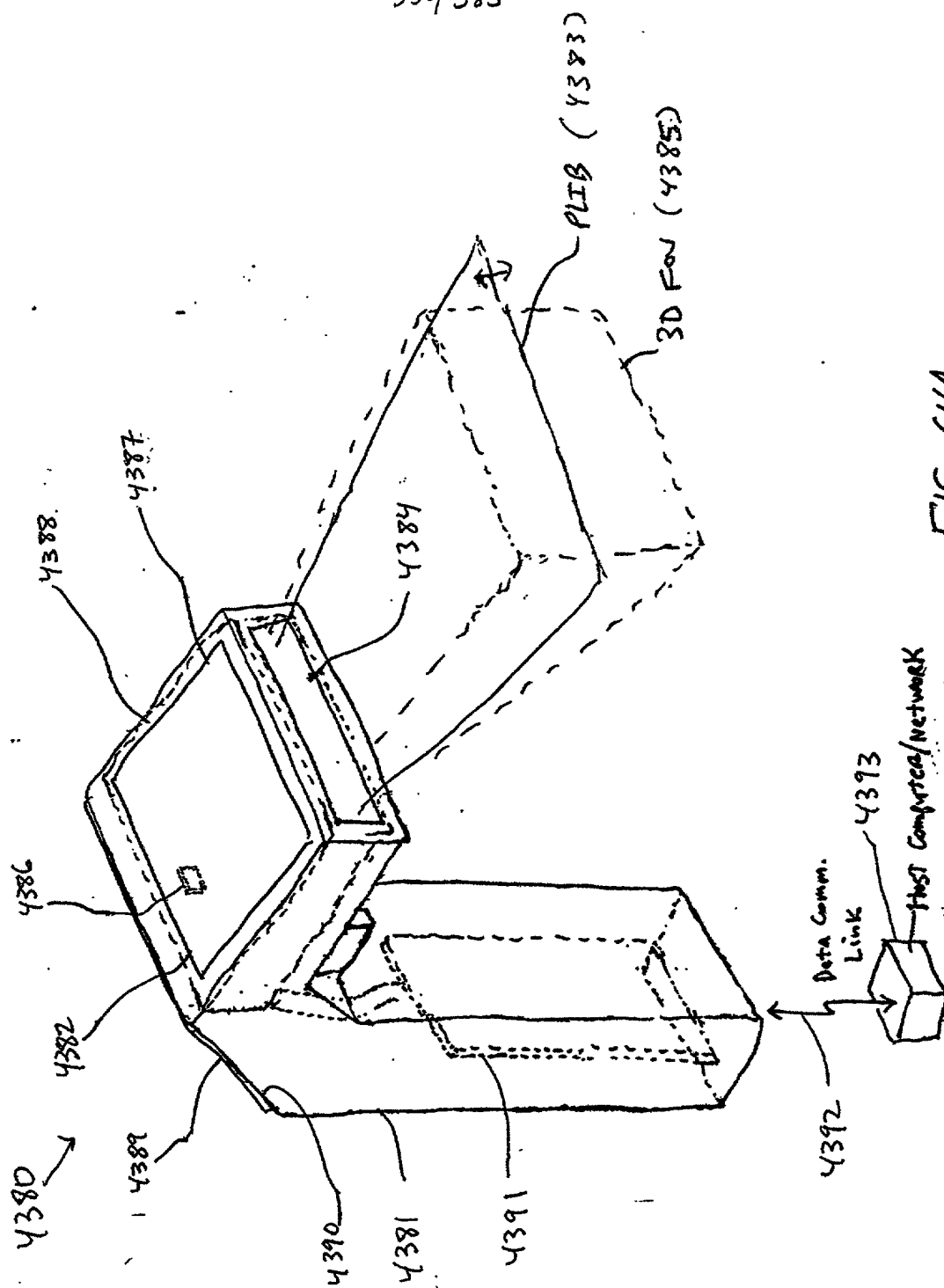


FIG. 64A



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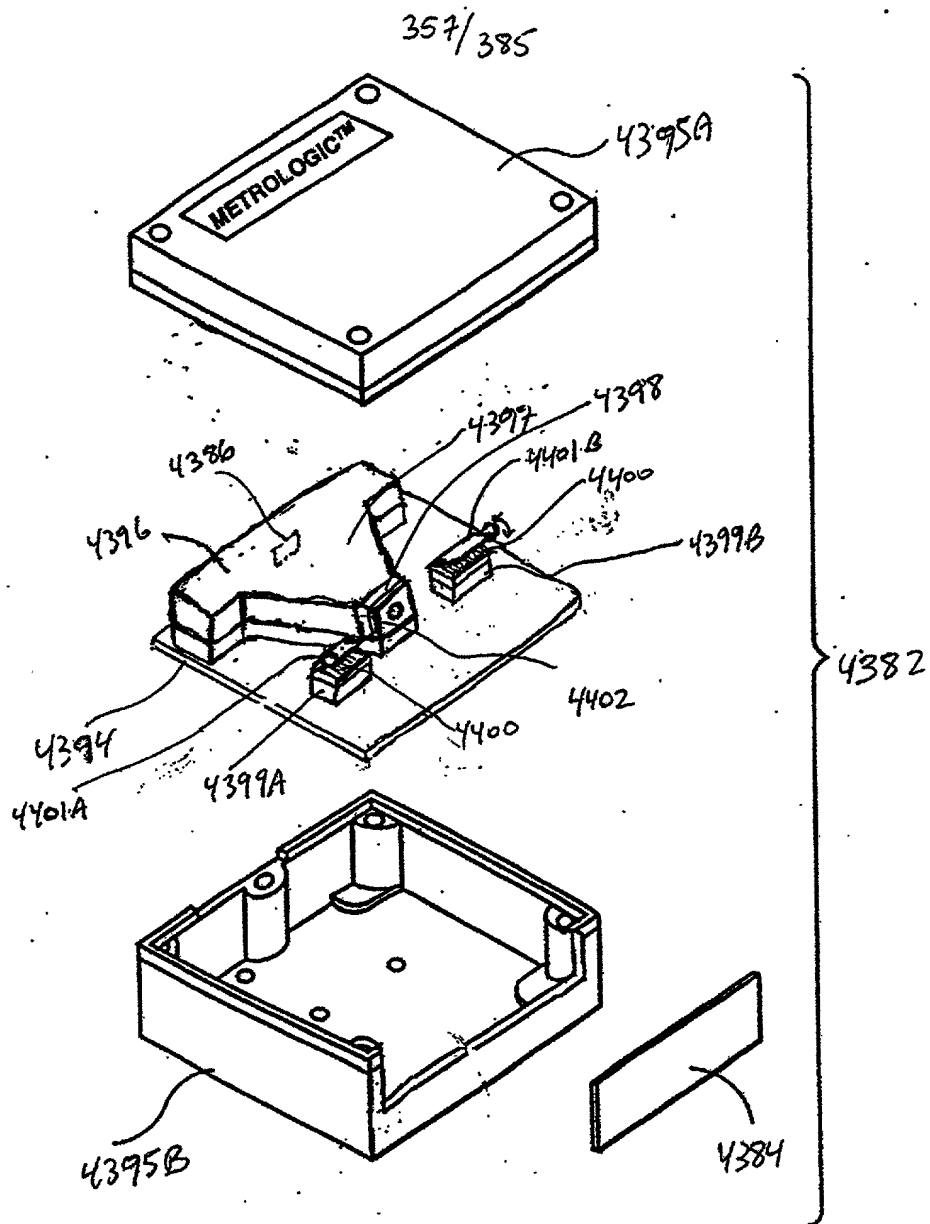


FIG. 64B

\* E-optical  
Shutter Before  
IP Lens  
Fig. 1E24A

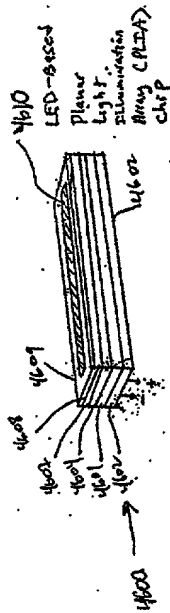


FIG. 67A

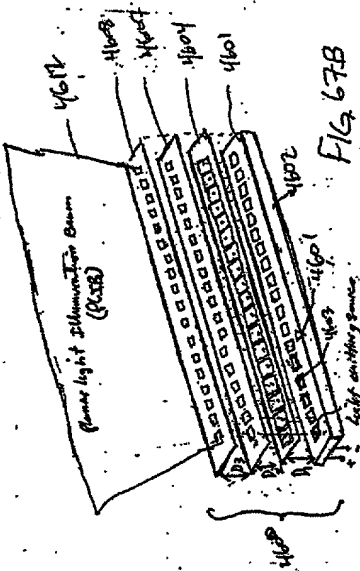


FIG. 67B

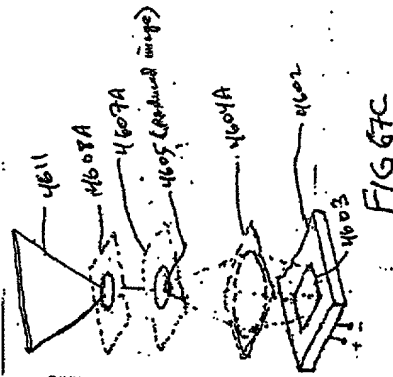


FIG. 67C

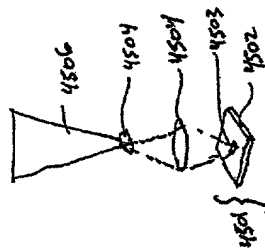


FIG. 65B

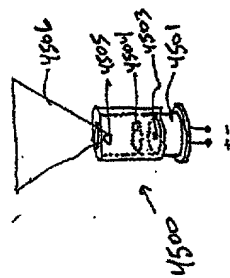


FIG. 65A

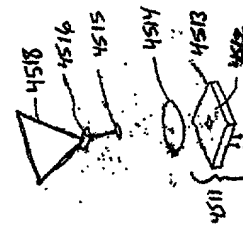


FIG. 66B

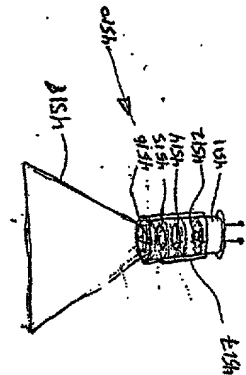


FIG. 66A

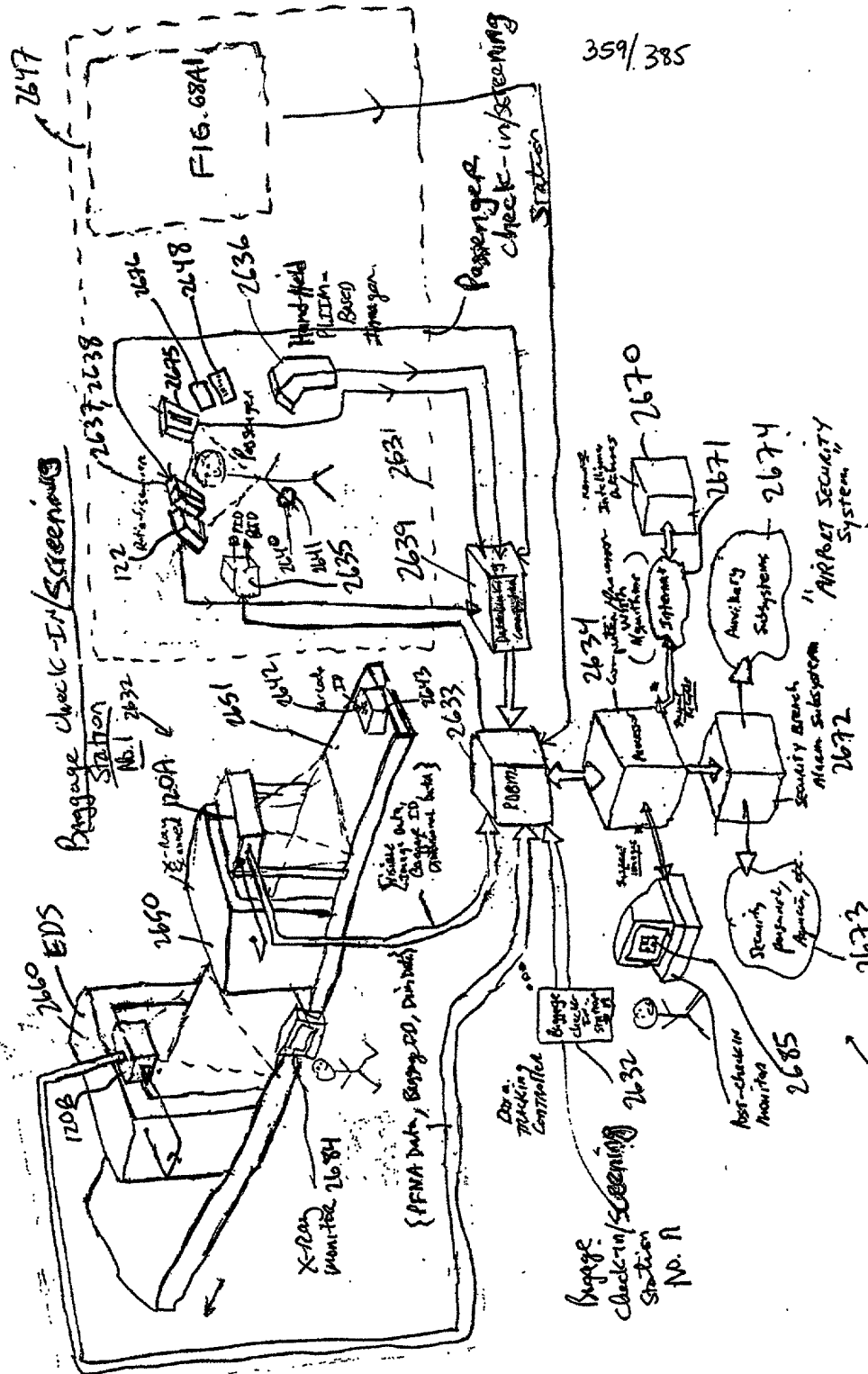


FIG. 68.

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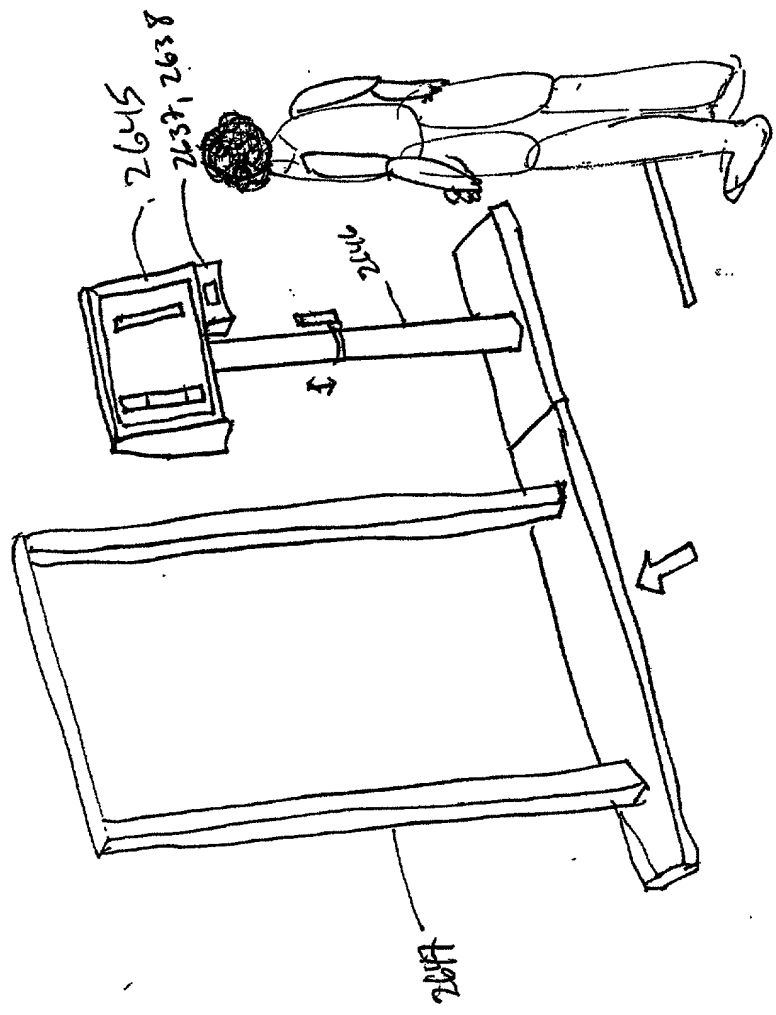
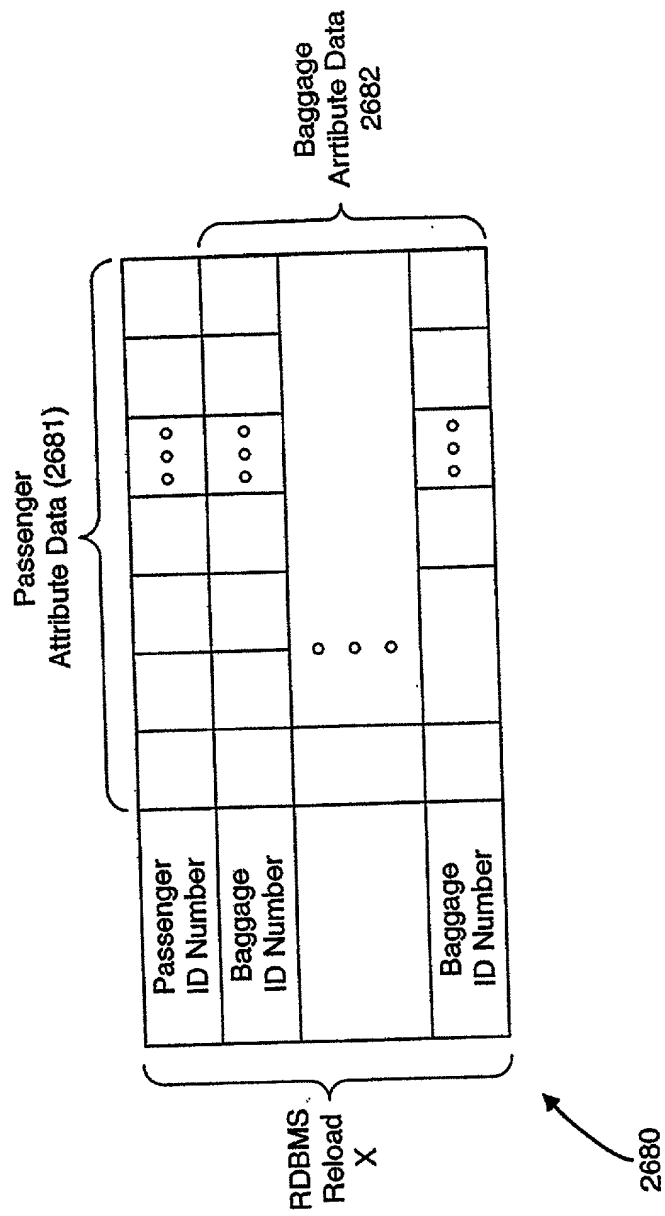


FIG. 68A



**FIG. 68B**

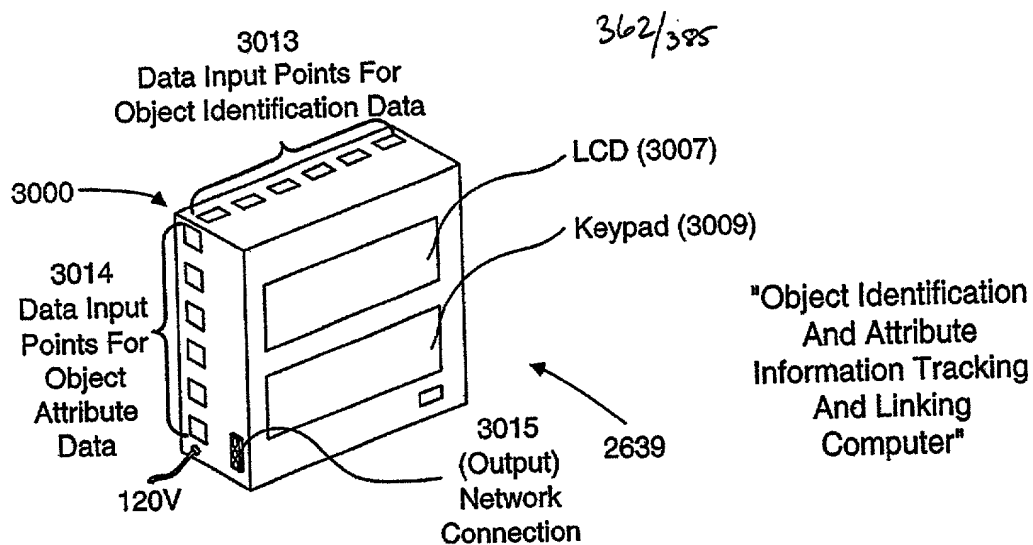


FIG. 68C1

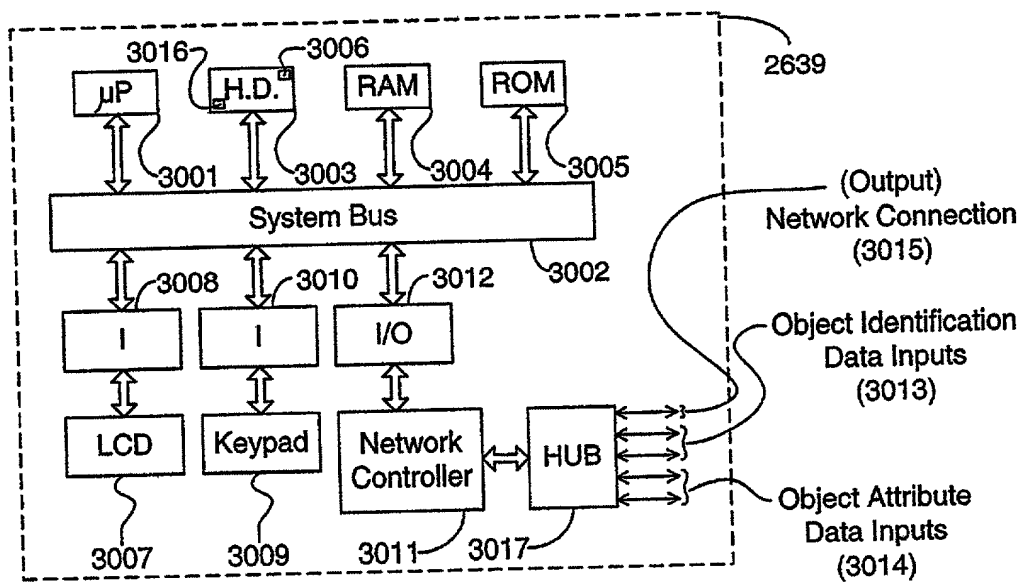


FIG. 68C2

Object Identification And Attribute Information Tracking And Linking Computer System.

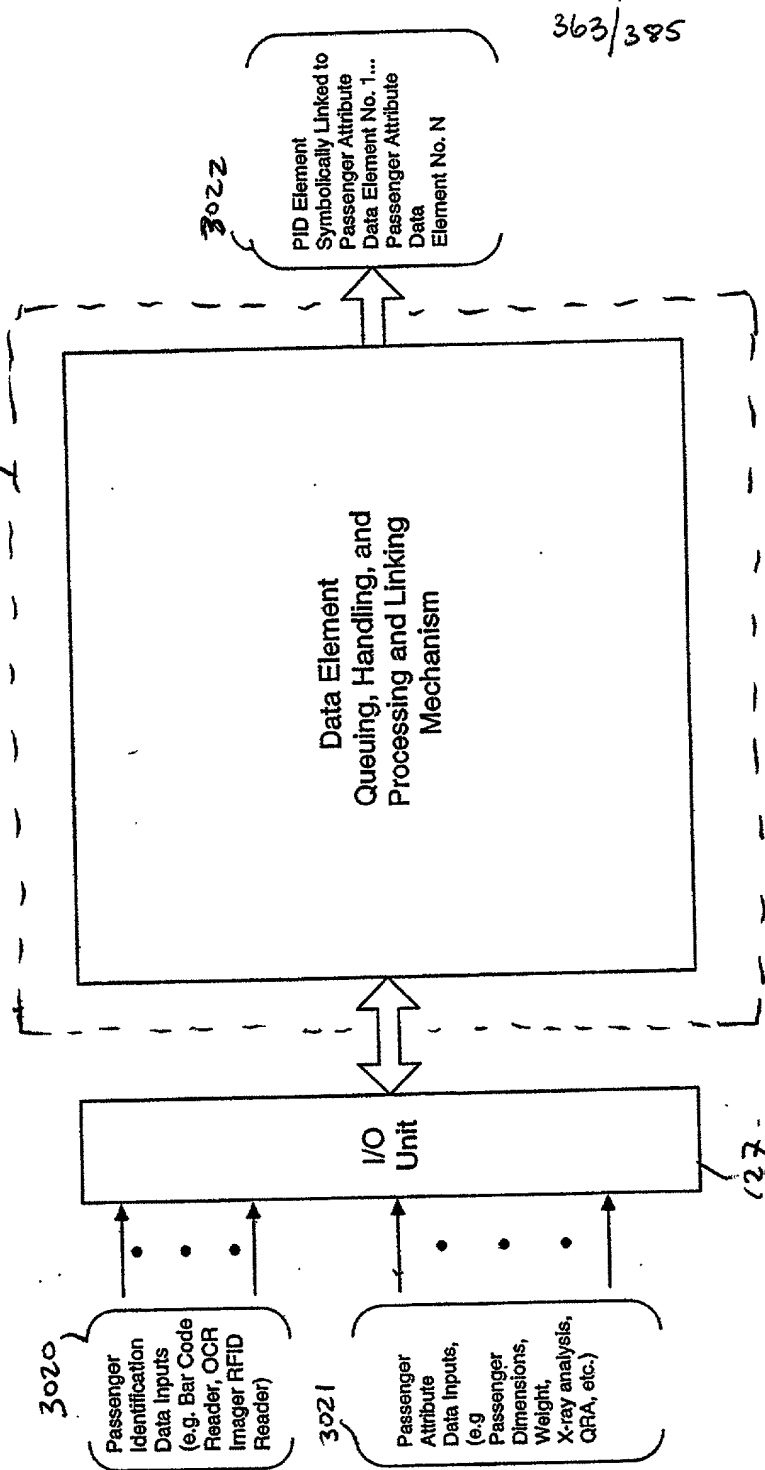


FIG. 68C3

# Data Element Queuing, Handling, and Processing Subsystem Employed In The Object Identification And Attribute Acquisition System Of The Present Invention. (131)

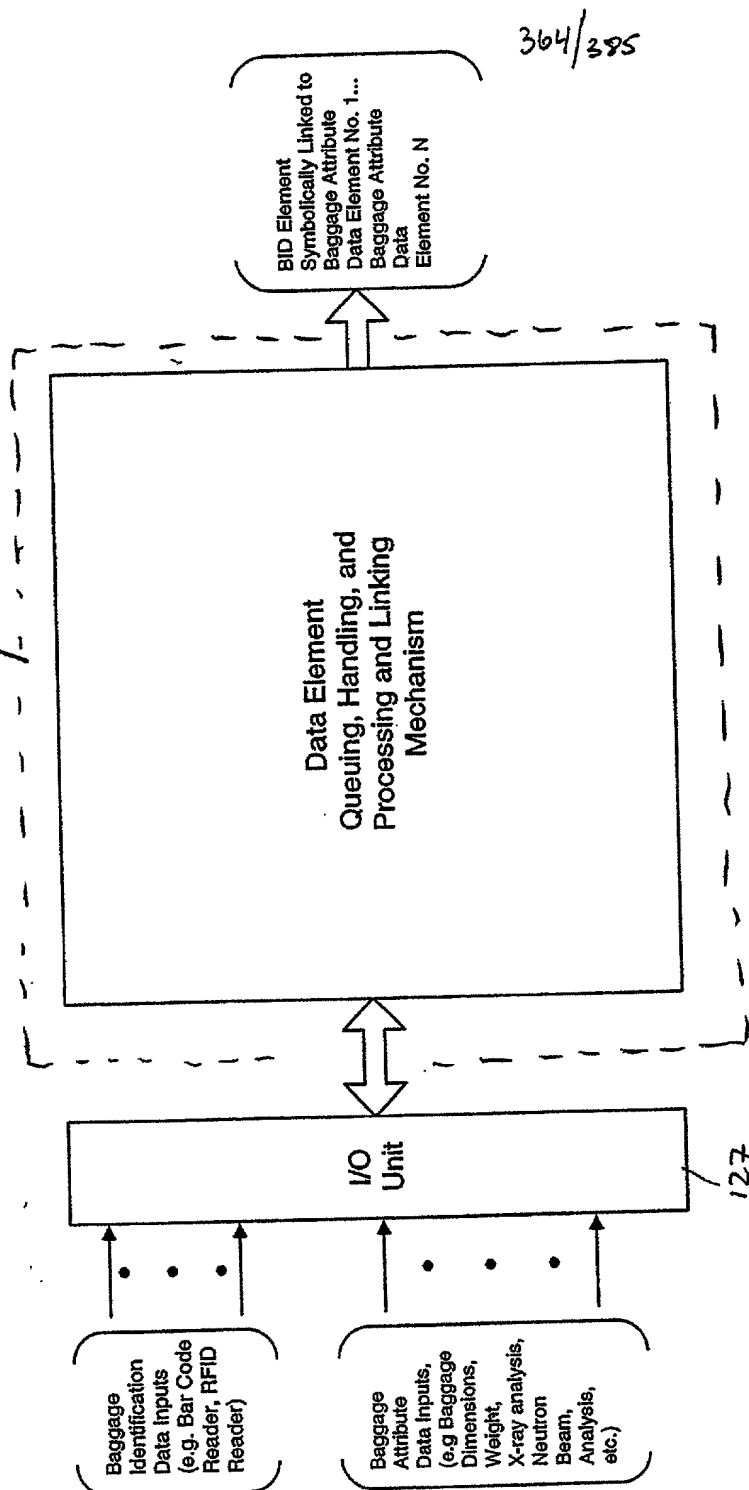


FIG. 68C4



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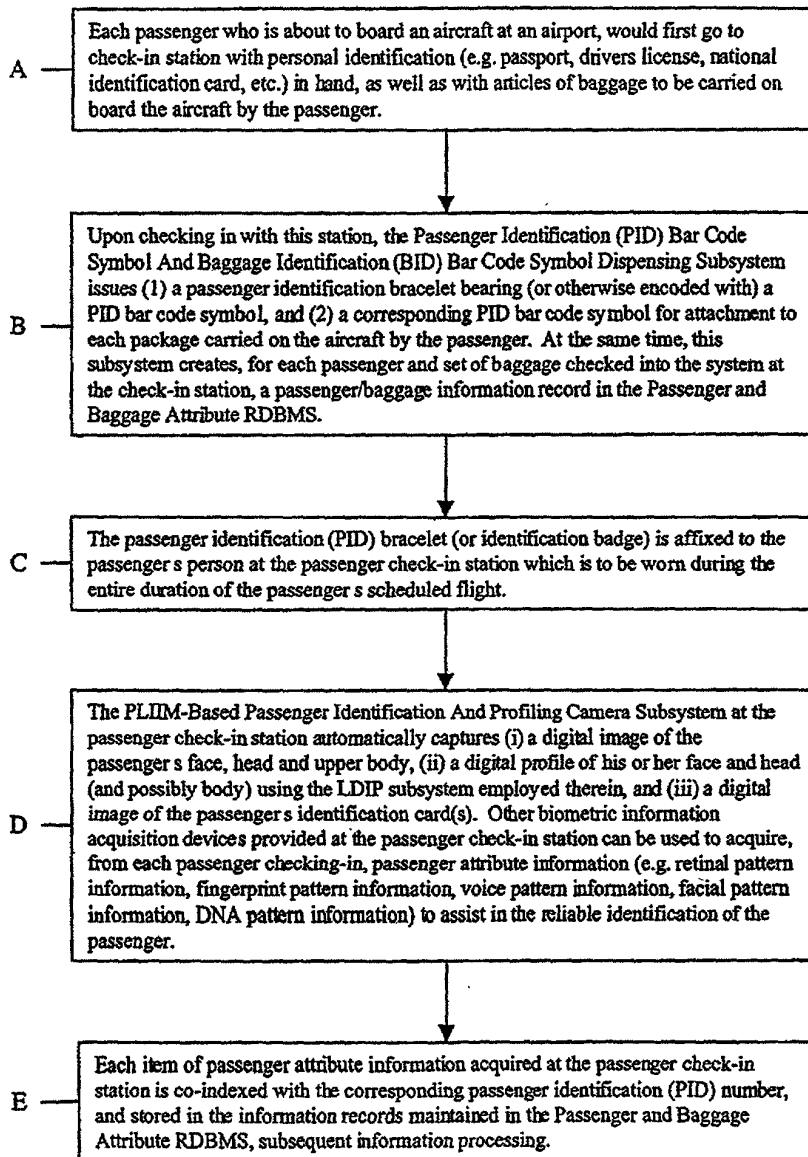


FIG. 68D1

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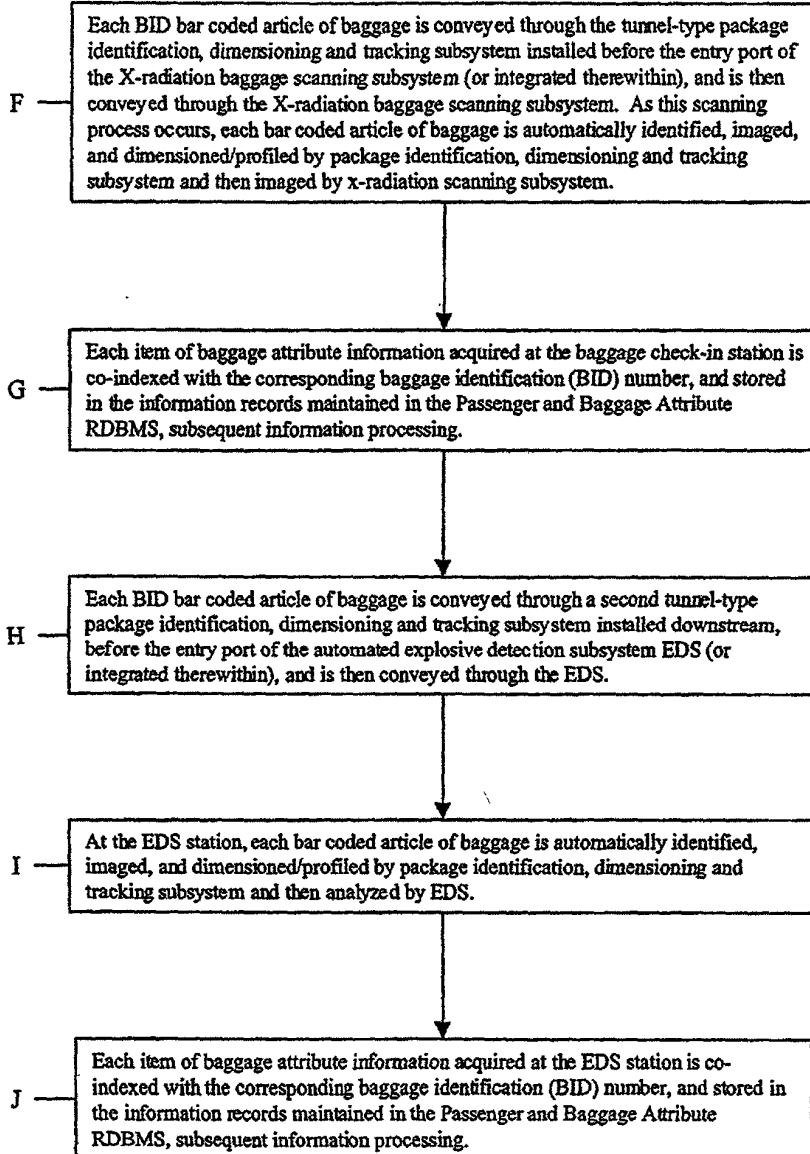


FIG. 68D2

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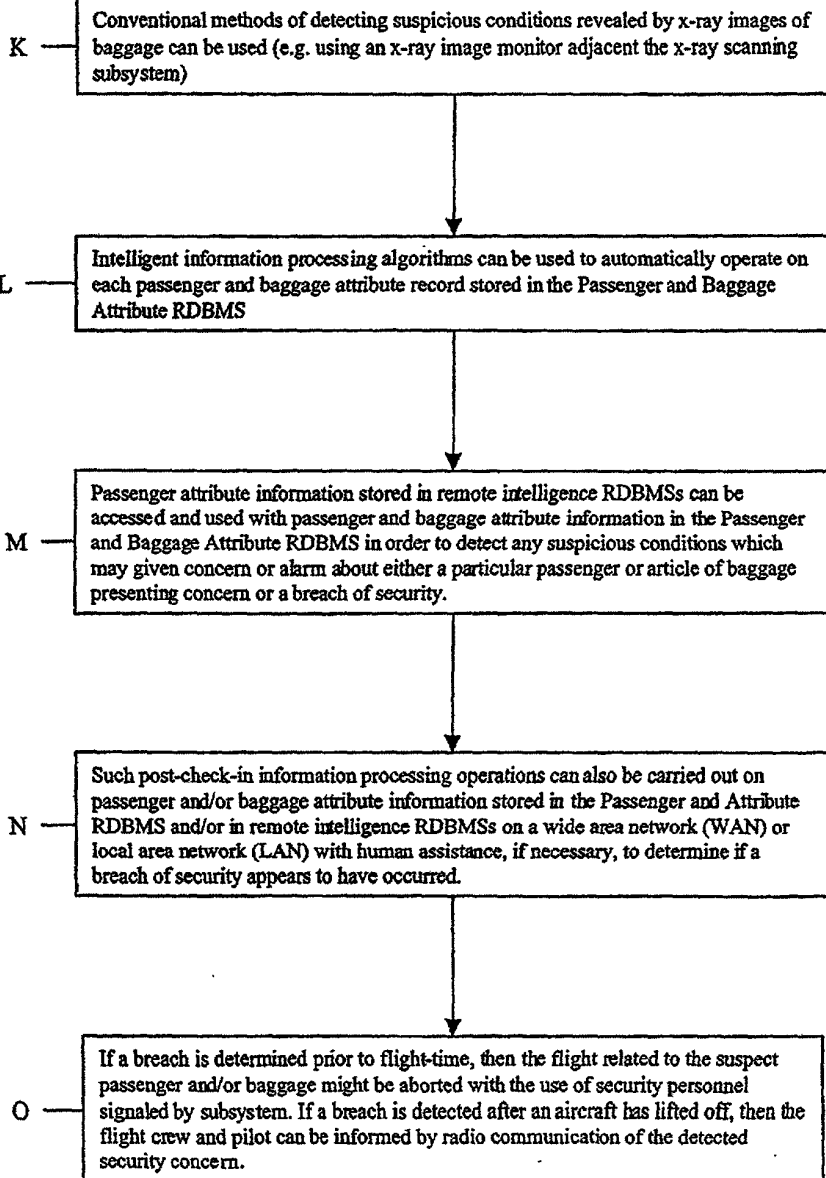


FIG. 68D3

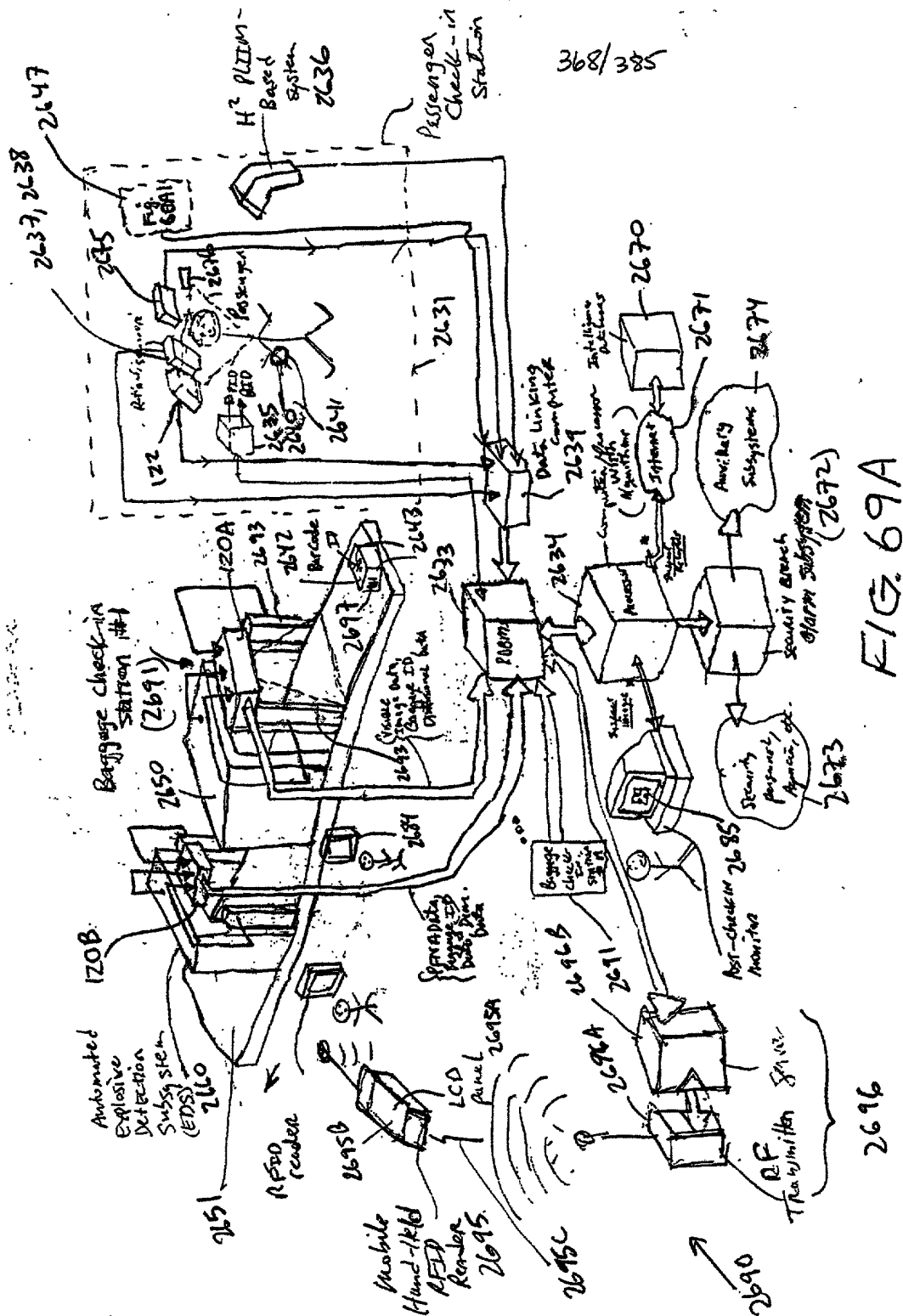


FIG. 69A

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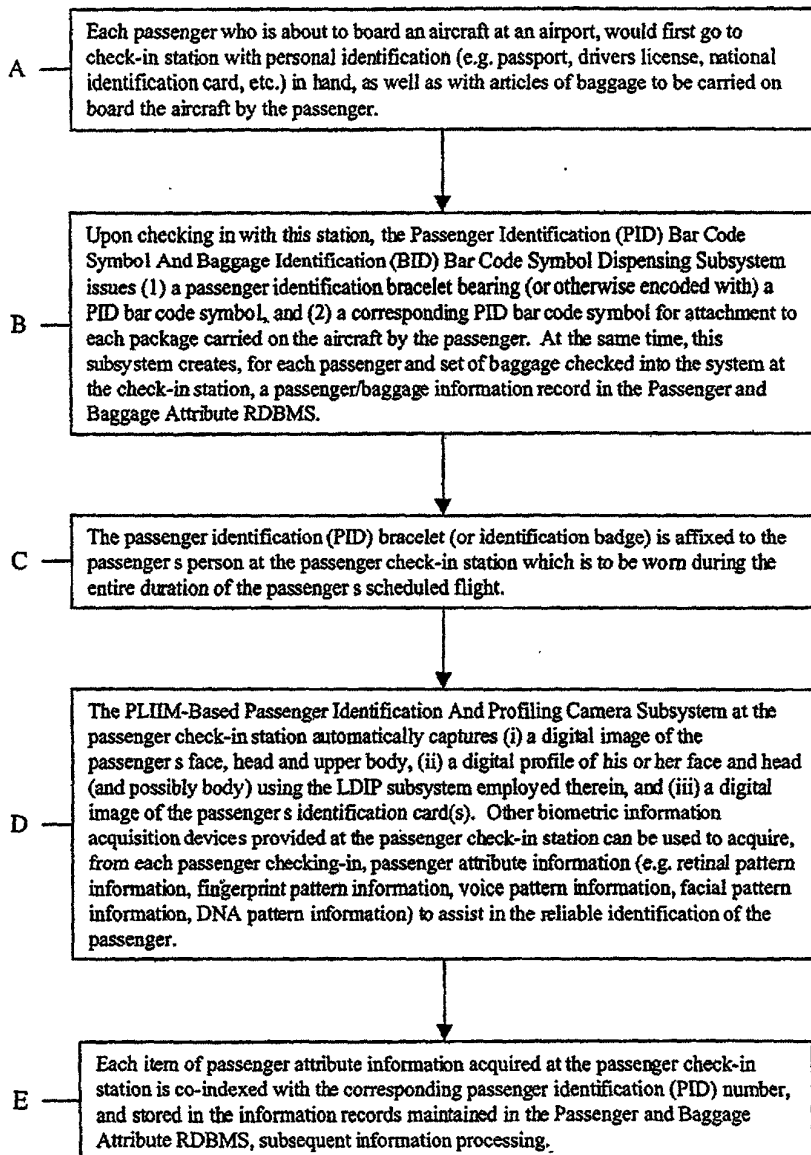


FIG. 69B1

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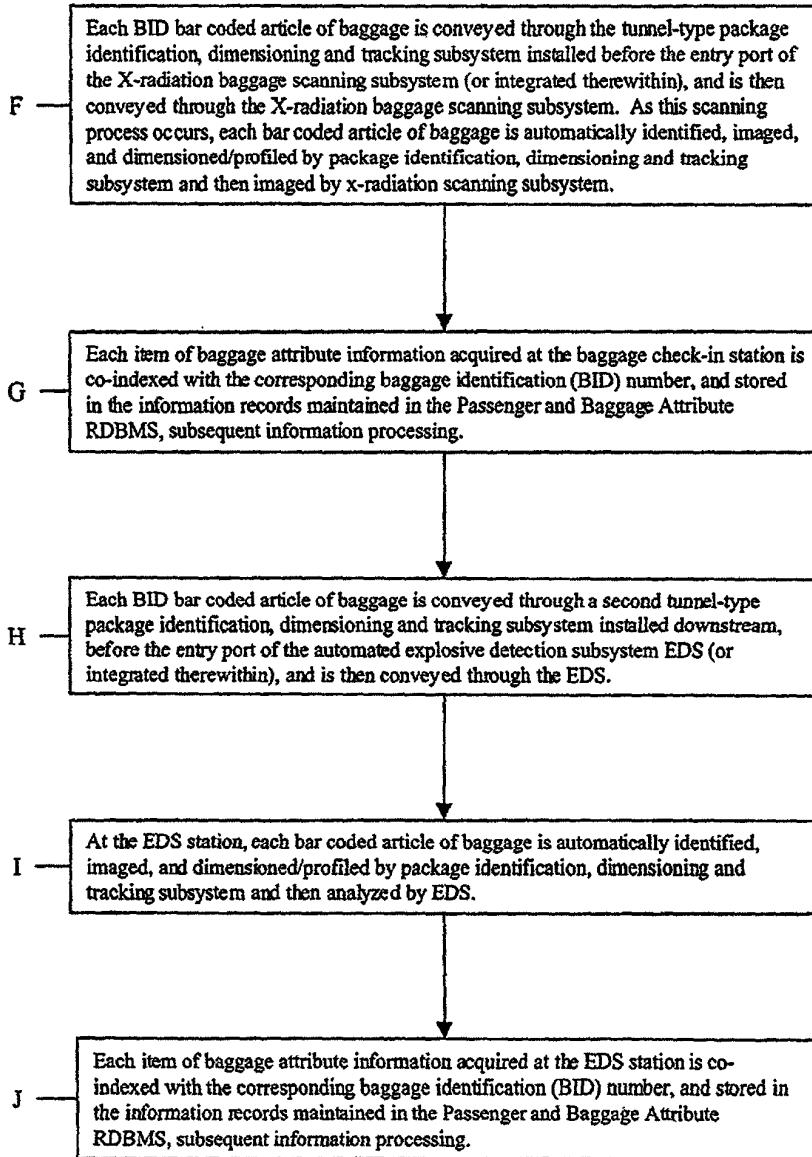


FIG 69B2

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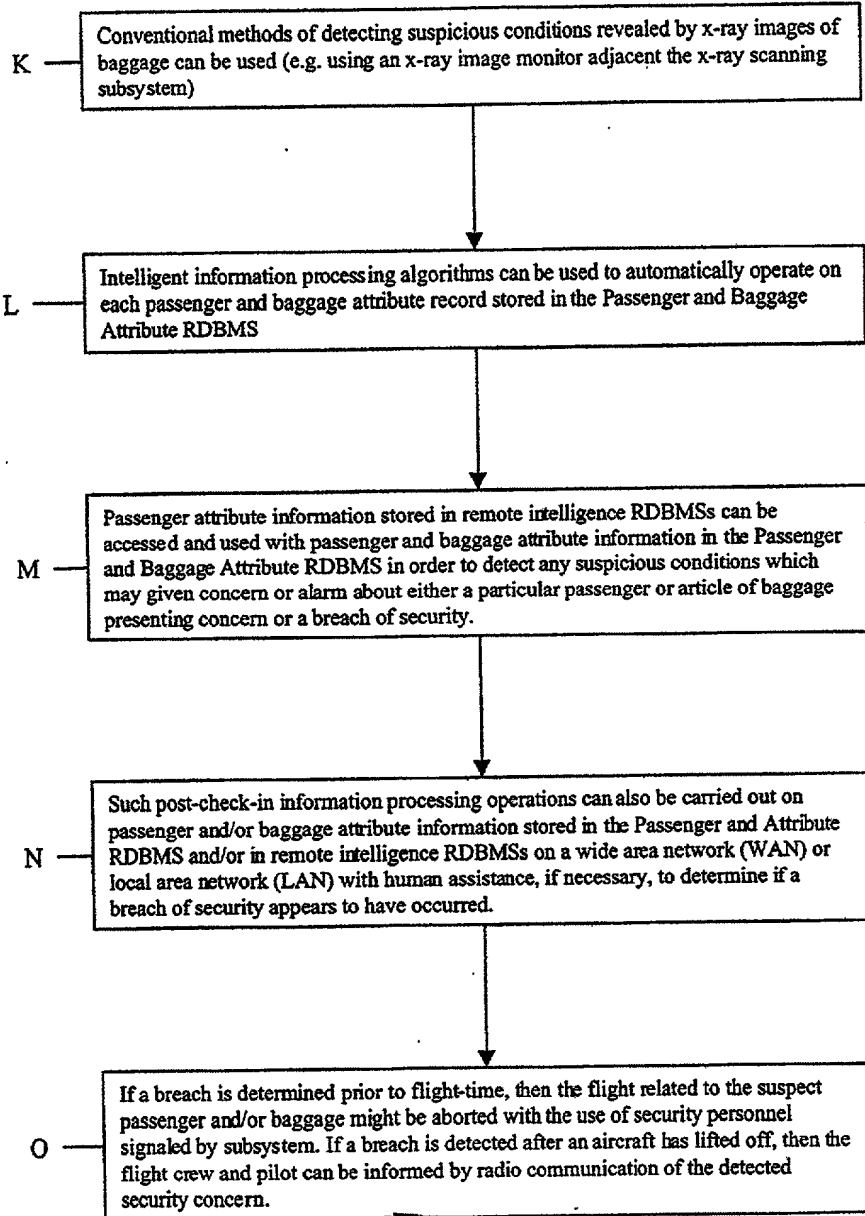
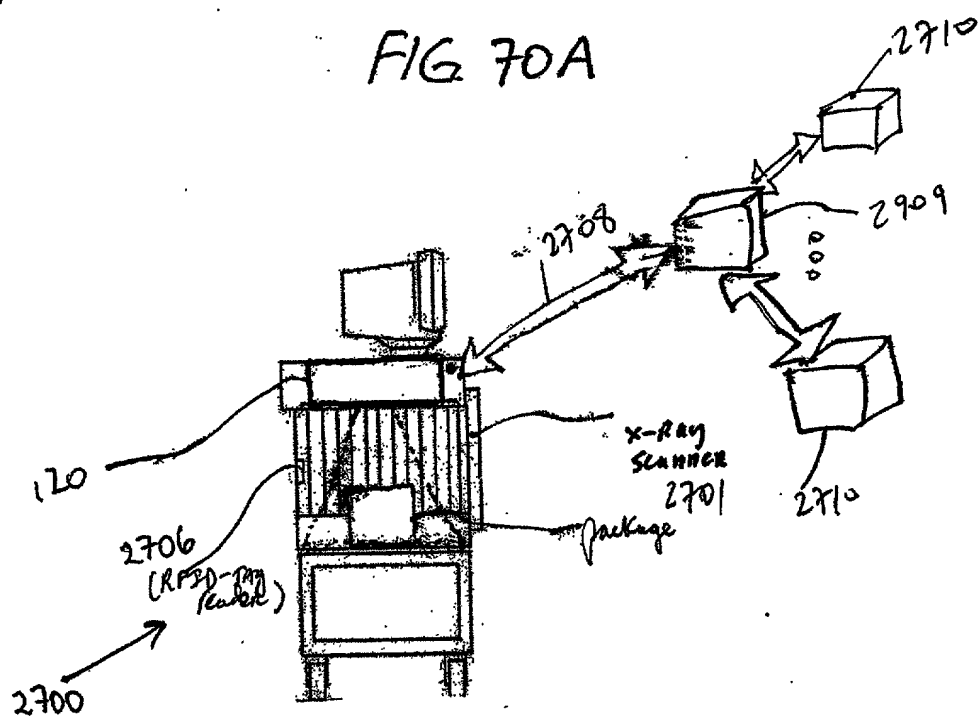
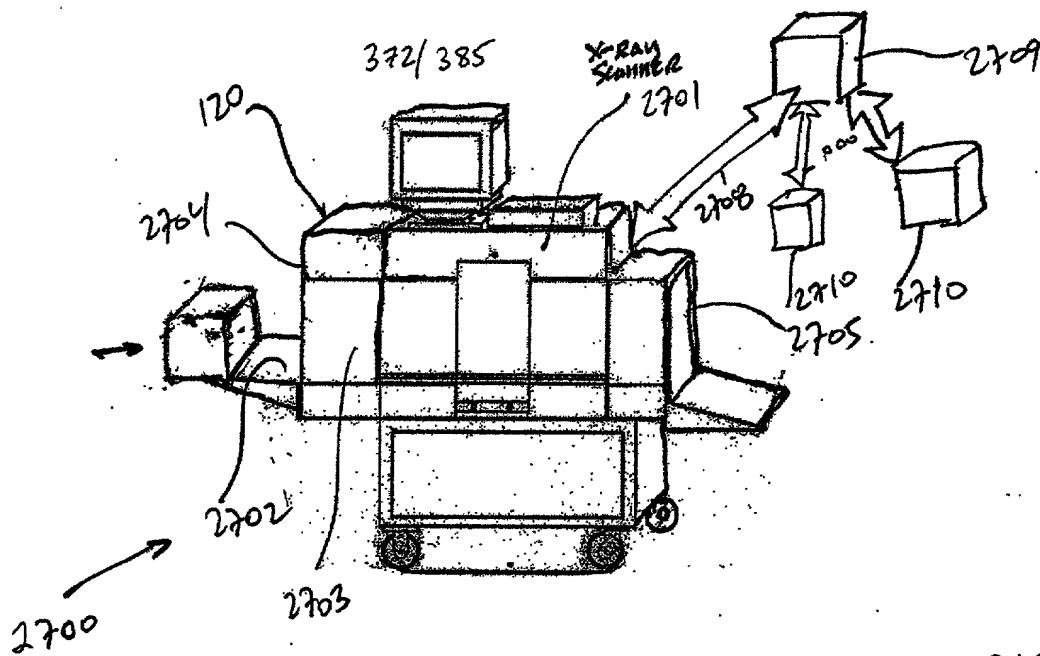


FIG. 69B3





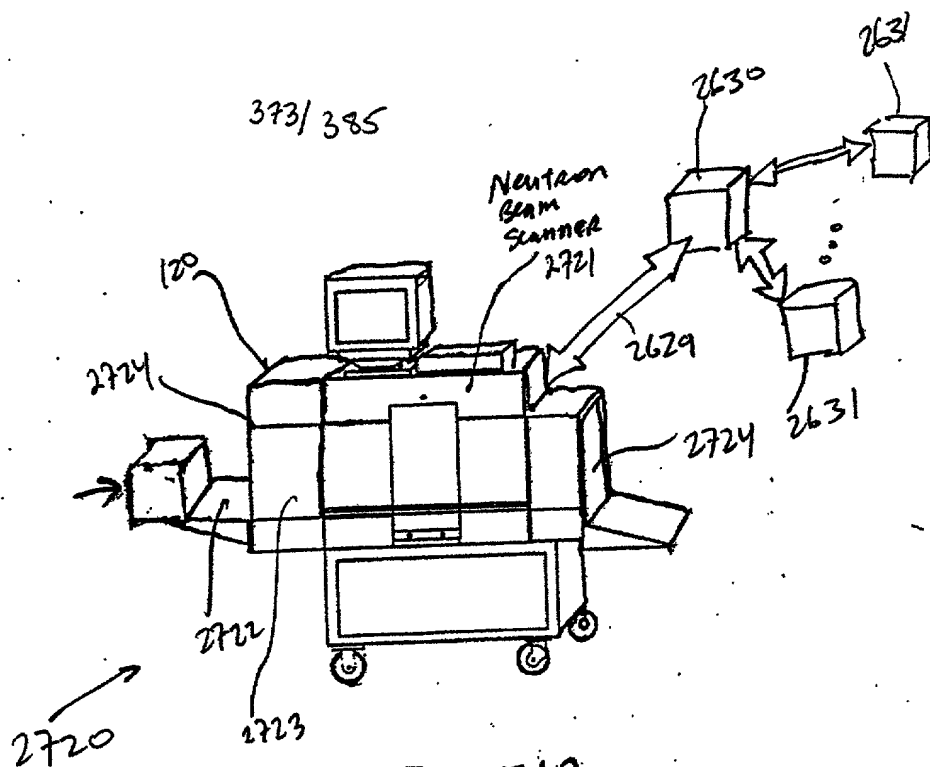


FIG 71A

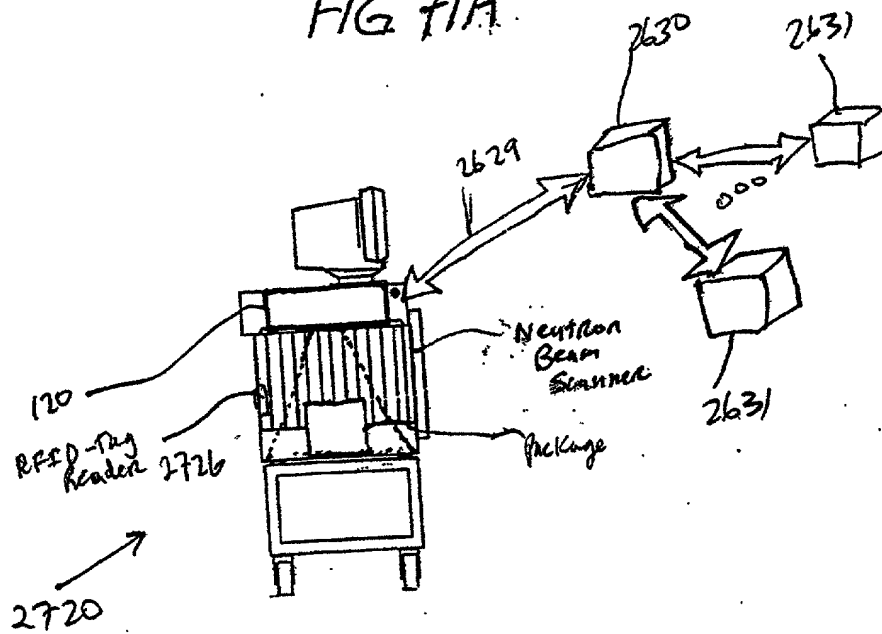


FIG. 7B

"Electromagnetic  
Inspection  
System"

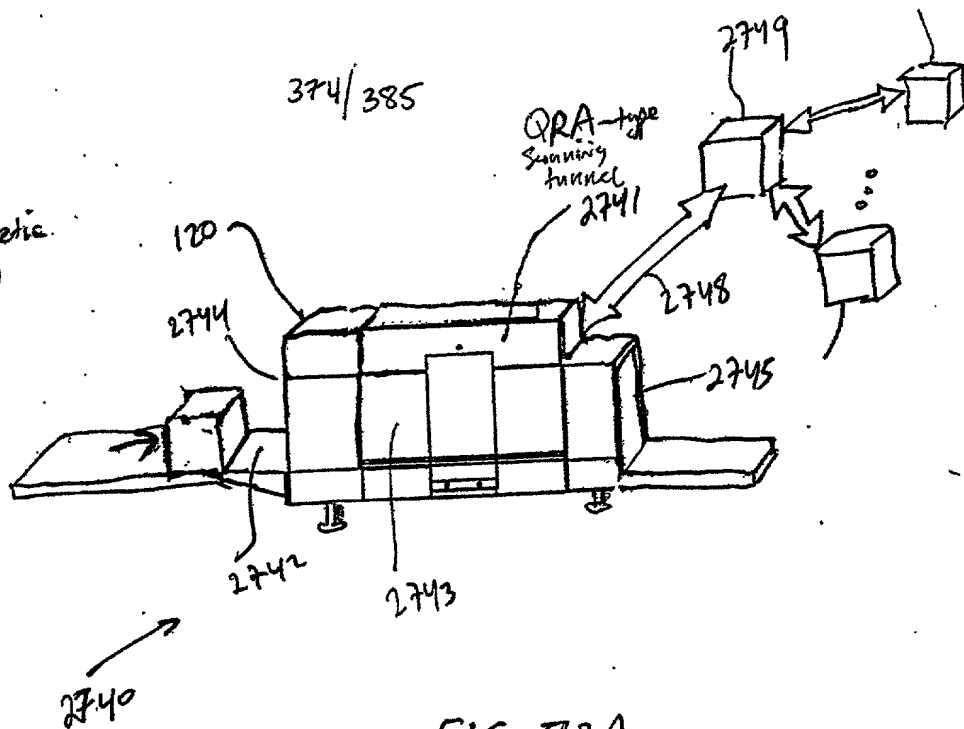


FIG 72A

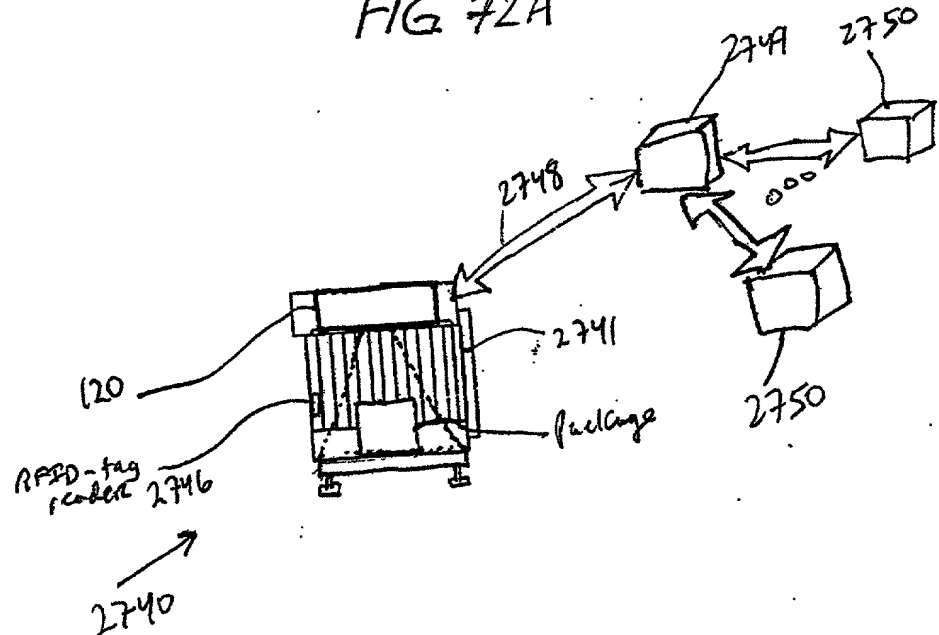
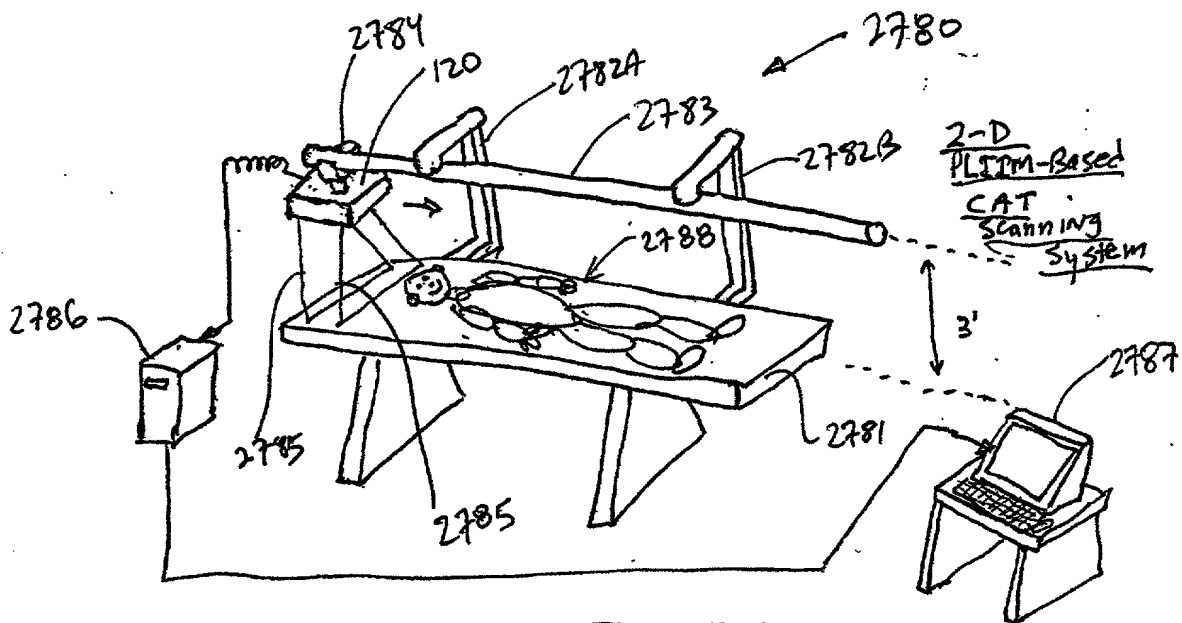
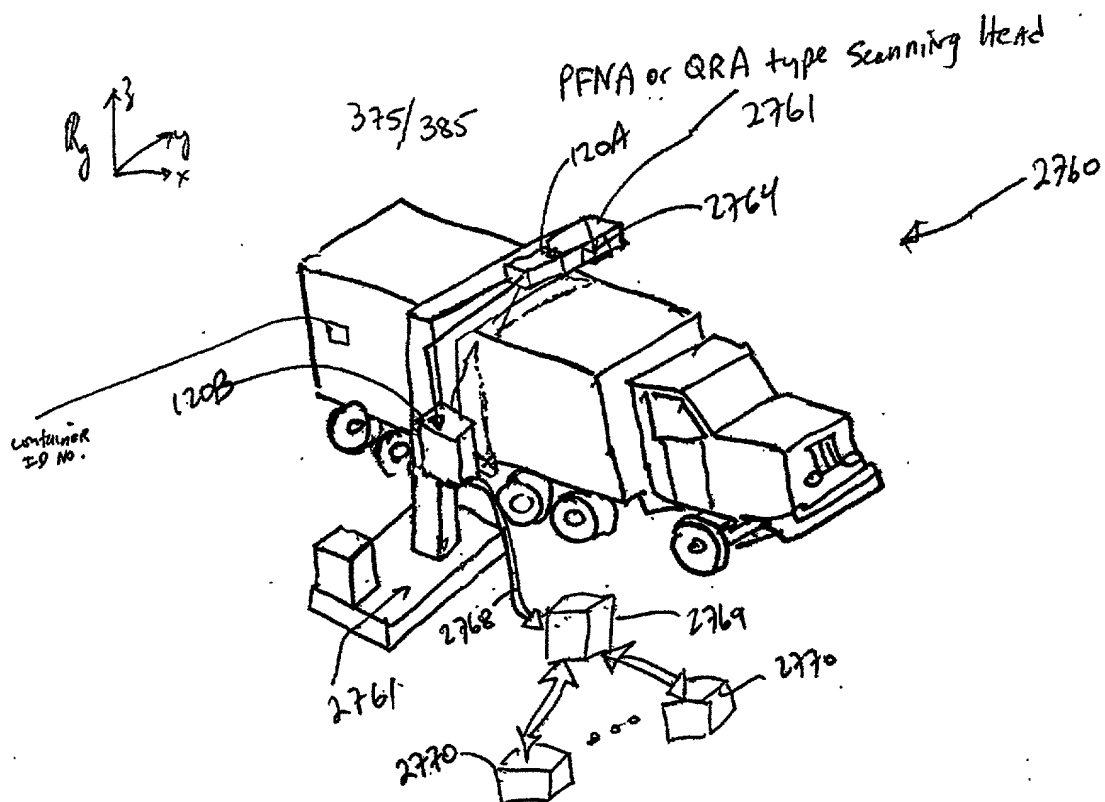
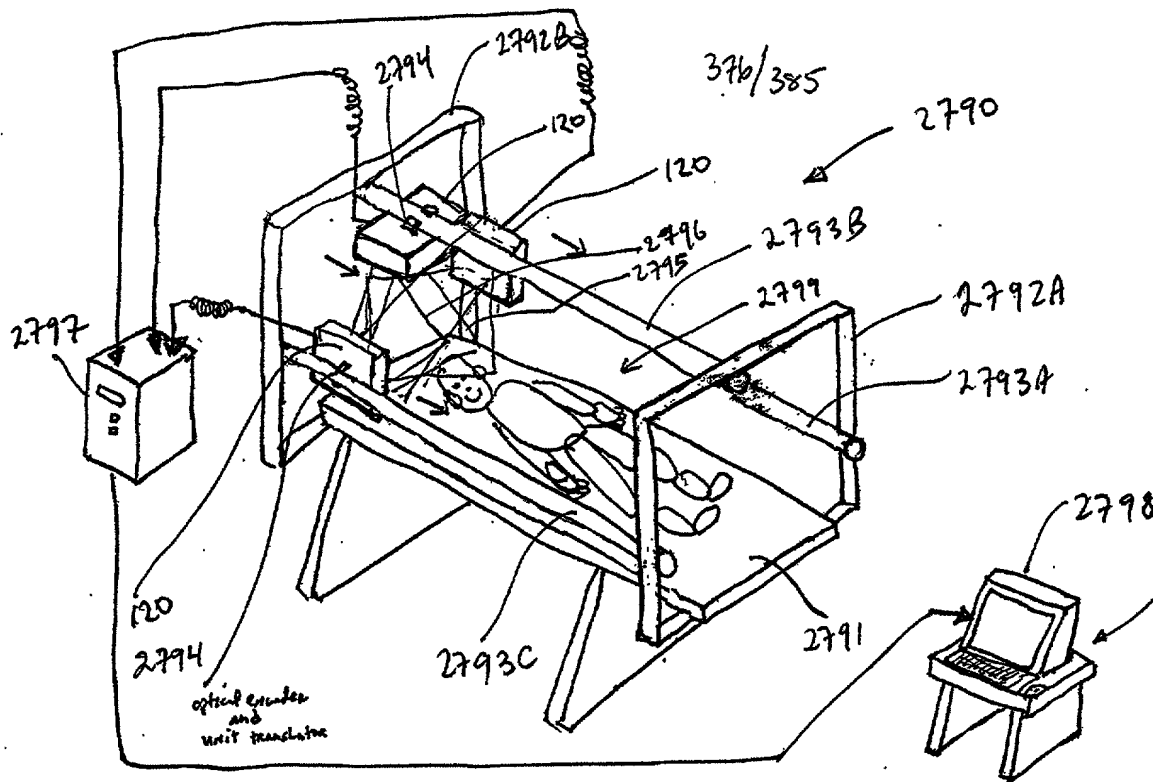


FIG 72B





3-D PLIM-Based  
CAT Medical Scanning  
System

FIG. 75

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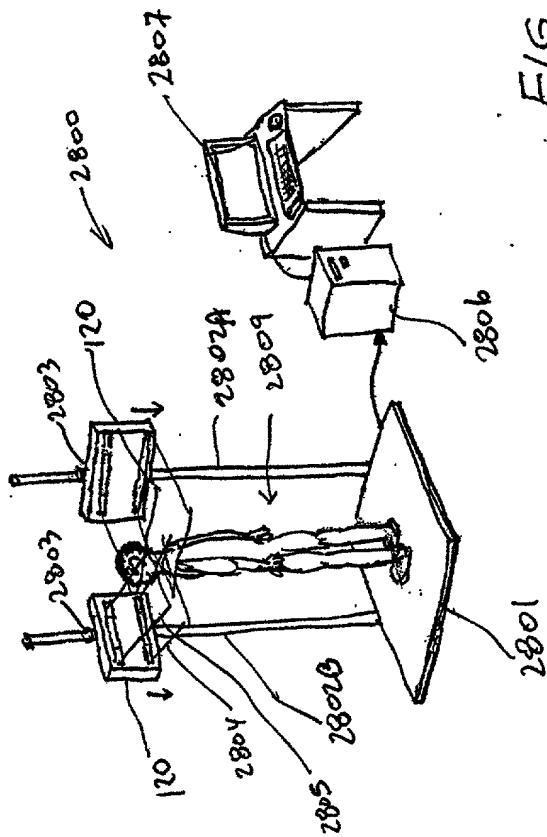


FIG. 76

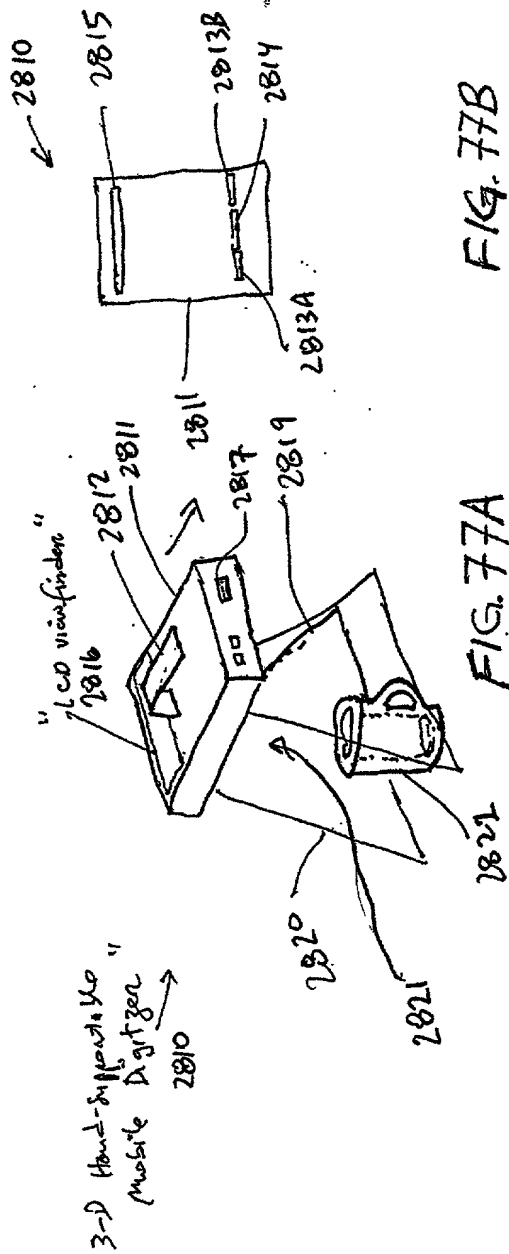


FIG. 77A

FIG. 77B

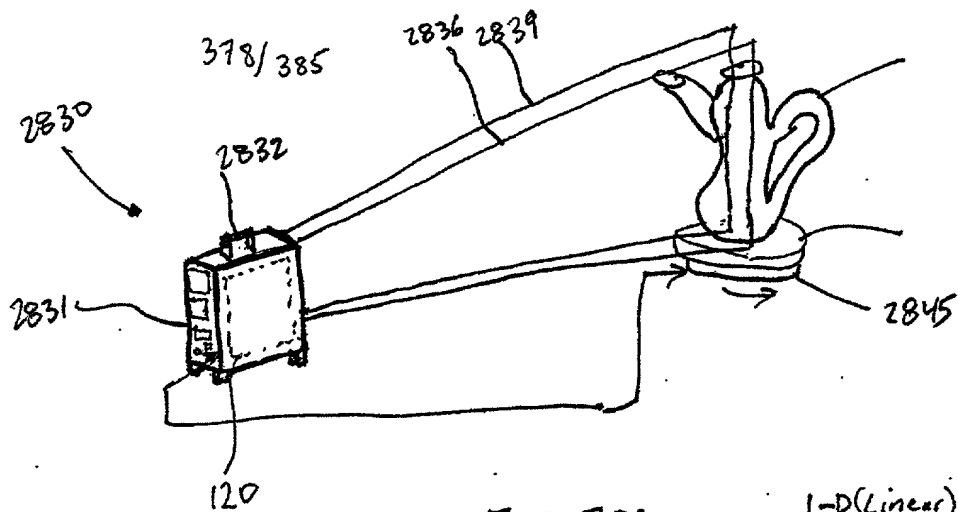


FIG. 78A

1-D (Linear) sensor

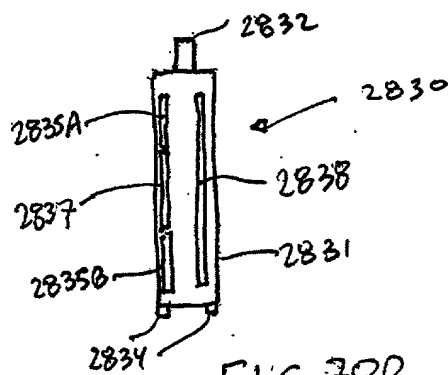


FIG. 78B

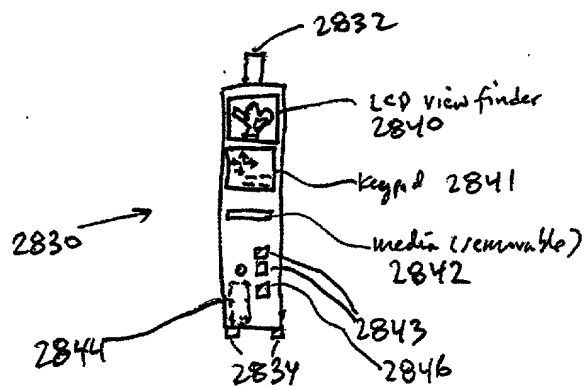
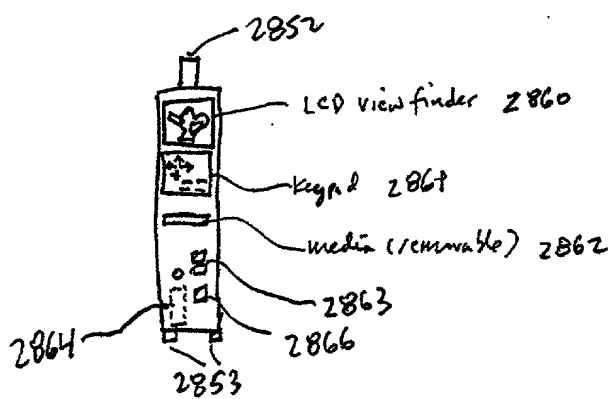
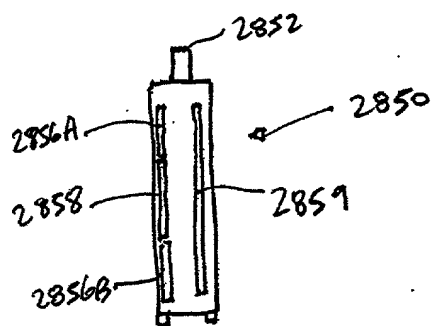
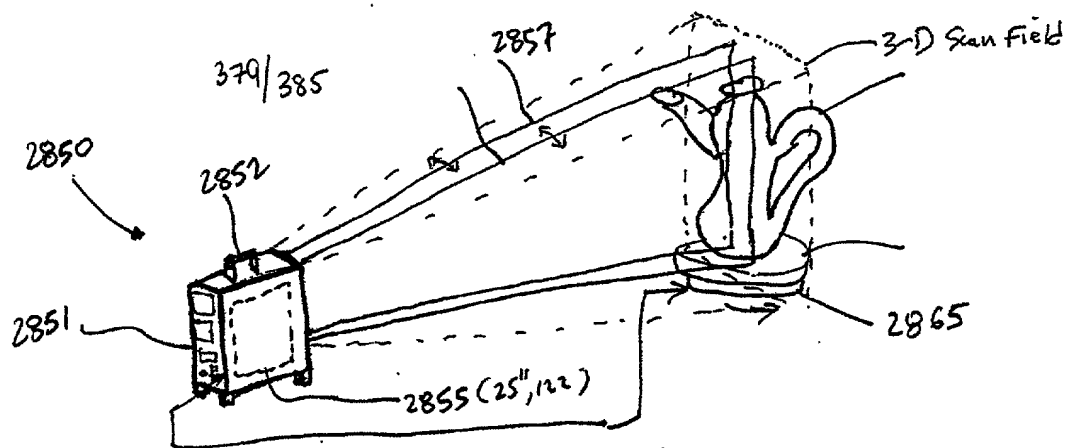


FIG. 78C



2-D (AREA) : sensor





# Automatic Vehicle Identification (AVI) System of Invented Invention

\* Employing overhead profiling  
and imaging techniques during  
license plate image capture

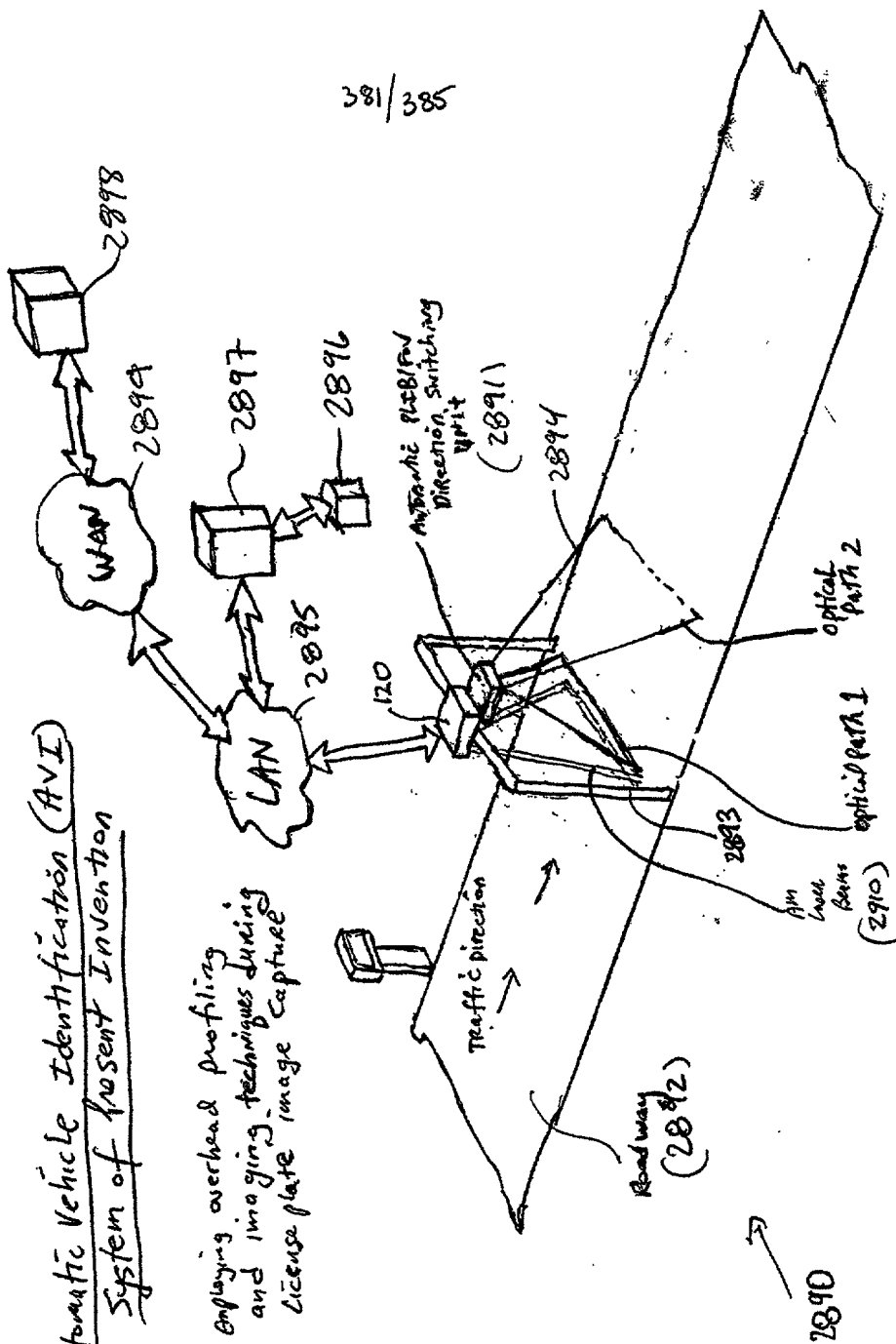


FIG. 81A

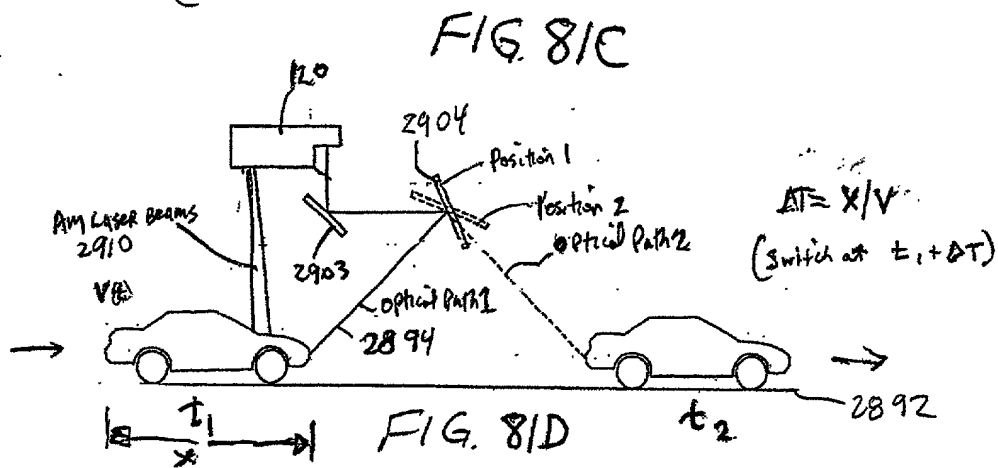
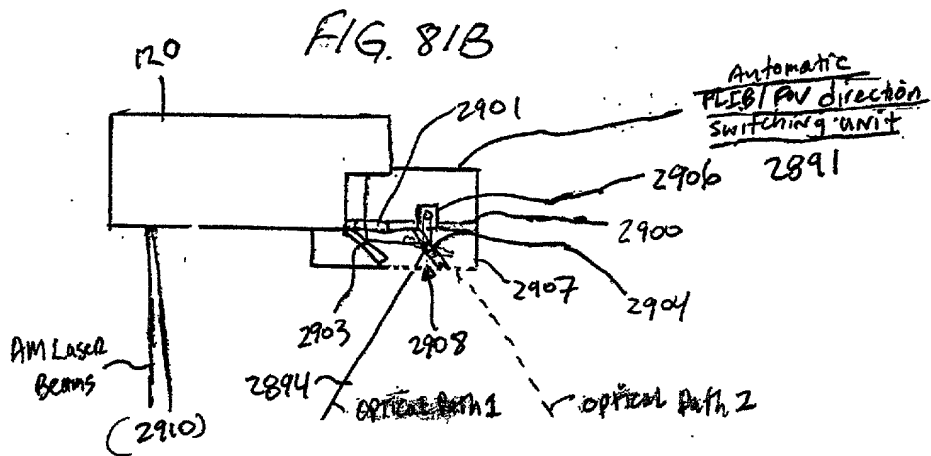
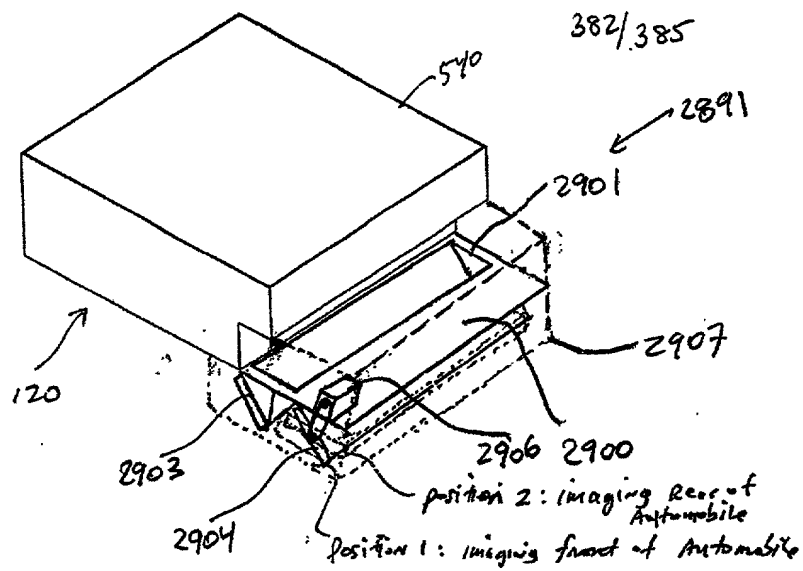
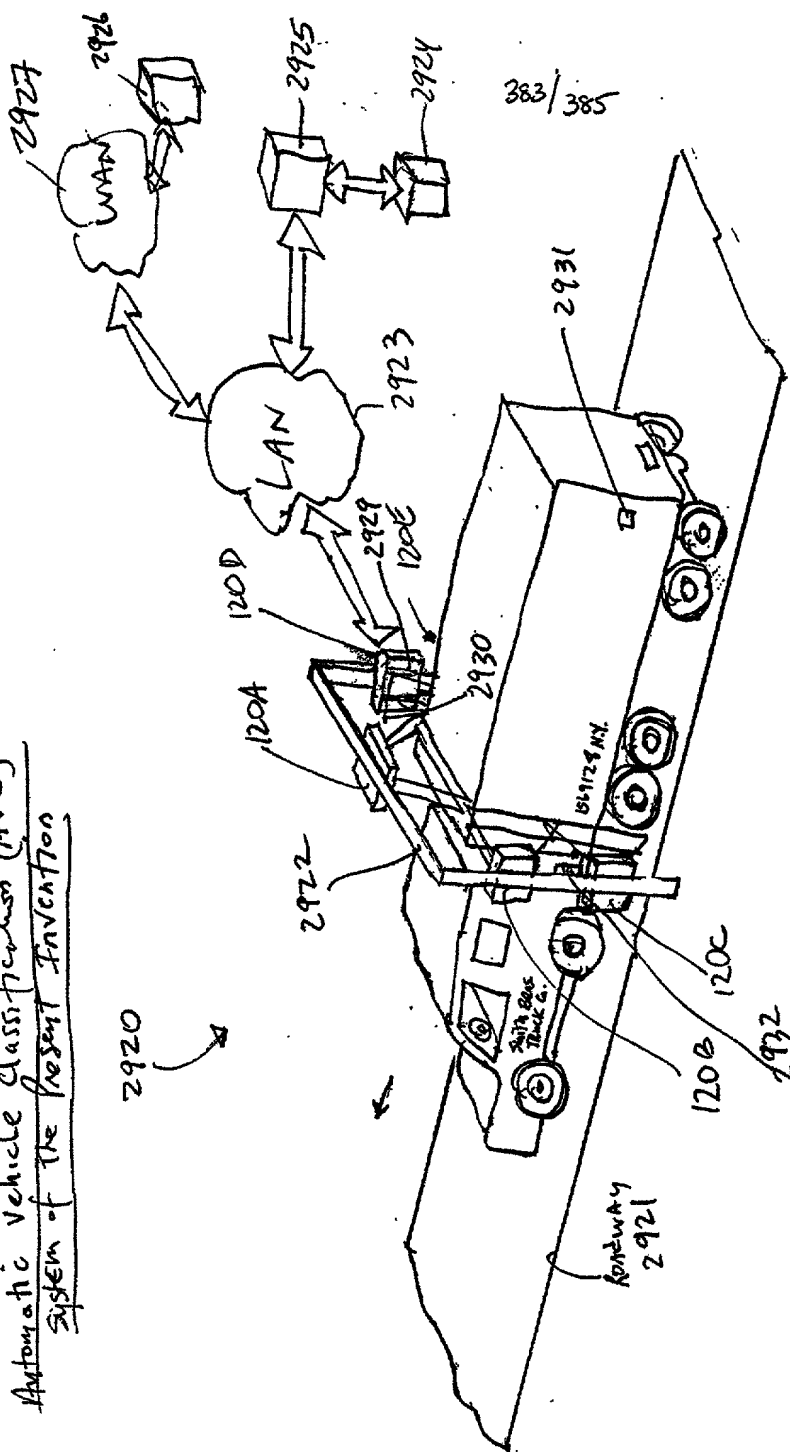


FIG. 8I D

Automatic Vehicle Classification (AVC)  
System of the Present Invention



Employing over head and lateral  
profiling and imaging  
techniques

FIG. 82

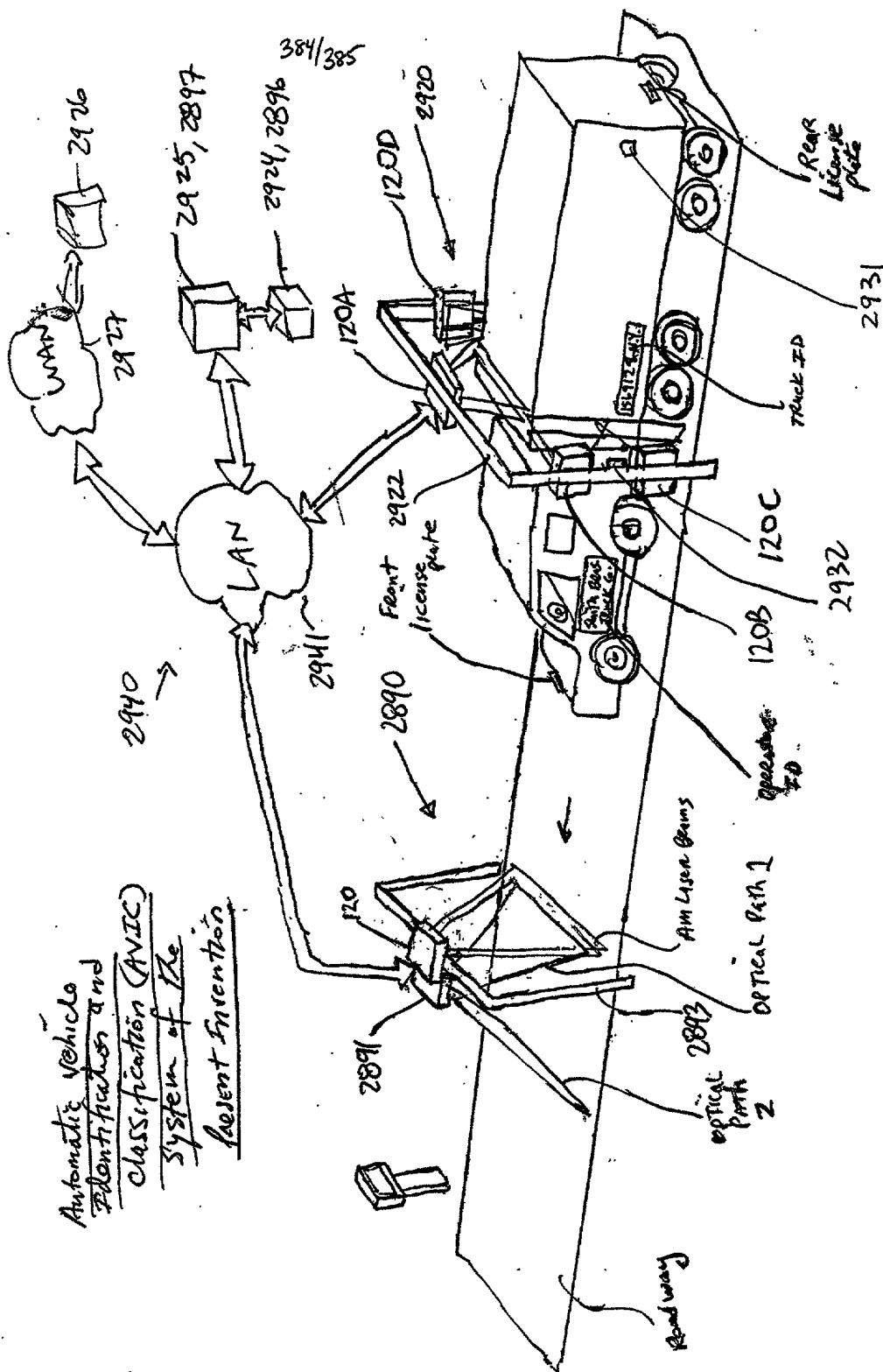


FIG. 83

